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MONTHLY BULLETIN

OF THE

STATE BOARD OF HEALTH

OF

MASSACHUSETTS.

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WEEKLY RETURNS OF DEATHS FROM CITIES AND TOWNS OF MORE THAN 10,000 POPULATION.

A

WEEK ENDING JAN. 1, 1910.

CITIES AND TOWNS.	Population,[1] Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	Deaths from— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	268	55	91	47	26	7	1	1
Worcester,	136,476	53	6	15	7	5	1	1	–
Fall River,	106,486	33	10	14	9	3	–	–	–
Cambridge,	102,112	42	11	24	11	9	–	1	–
Lowell,	96,380	56	15	23	15	4	3	1	–
New Bedford,	85,516	21	12	6	4	1	–	–	–
Lynn,	84,623	21	0	7	1	6	–	–	–
Springfield,	84,237	26	6	10	6	–	1	1	–
Lawrence,	78,000	31	4	14	6	6	–	1	–
Somerville,	76,049	27	4	8	6	–	–	1	–
Brockton,	55,039	19	6	4	2	1	–	–	–
Holyoke,	53,590	19	7	7	3	4	–	–	–
Malden,	41,941	12	2	2	2	–	–	–	–
Chelsea,	40,080	11	2	2	2	–	–	–	–
Newton,	39,642	14	1	1	–	–	1	–	–
Salem,	39,019	14	4	–	–	–	–	–	–
Haverhill,	38,362	20	2	3	2	–	–	–	–
Fitchburg,	34,263	9	2	2	2	–	–	–	–
Everett,	33,597	14	6	1	–	–	–	–	–
Quincy,	31,937	13	4	2	1	–	–	–	–
Taunton,	30,967	22	3	6	4	–	–	–	–
Waltham,	28,761	8	–	1	–	–	–	1	–
Pittsfield,	27,932	19	3	3	2	1	–	–	–
Brookline,	26,674	10	1	2	2	–	–	–	–
Gloucester,	26,011	4	–	–	–	–	–	–	–
North Adams,	22,150	4	–	1	1	–	–	–	–
Northampton,	21,075	7	–	1	–	–	–	–	–
Chicopee,	21,049	8	6	4	3	1	–	–	–
Medford,	20,921	8	1	–	–	–	–	–	–
Beverly,	16,386	5	1	2	1	1	–	–	–
Leominster,	16,030	3	–	–	–	–	–	–	–
Hyde Park,	15,609	2	–	1	1	–	–	–	–
Melrose,	15,459	5	0	2	–	2	–	–	–
Newburyport,	14,834	6	–	3	–	3	–	–	–
Revere,	14,820	5	–	–	–	–	–	–	–
Westfield,	14,750	0	–	–	–	–	–	–	–
Woburn,	14,522	9	1	2	–	1	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	6	1	1	1	–	–	–	–
Attleborough,	13,913	8	1	3	1	1	–	–	–
Adams,	13,685	6	1	1	1	–	–	–	–
Clinton,	13,105	1	1	–	–	–	–	–	–
Gardner,	13,066	6	2	1	1	–	–	–	–
Milford,	12,722	7	0	3	–	3	–	–	–
Watertown,	12,676	4	0	2	2	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	3	2	3	2	–	–	1	–
Weymouth,	11,798	3	0	–	–	–	–	–	–
Framingham,	11,749	6	1	1	–	–	–	1	–
Wakefield,	11,124	5	–	4	2	1	–	–	–
Webster,	11,109	5	1	1	–	1	–	–	–
Arlington,	10,520	1	–	–	–	–	–	–	–
Greenfield,	10,140	2	–	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,401,701	911	185	284	150	80	13	10	1

[1] The populations were estimated upon the rate of growth from 1900 to 1905. Those of Taunton, Gloucester, North Adams and Clinton were allowed to stand as in 1905, having shown no increase during the five-year period. The gain in the population of Lowell is due to the annexation of a part of the town of Tewksbury. The population of Lawrence by the census of 1905 was 70,050, but, owing to the building of the new Wood and Arlington mills, an increase of about 8,000 is estimated by the Lawrence Board of Health, or 78,000.

WEEK ENDING JAN. 8, 1910.

CITIES AND TOWNS.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	268	55	97	48	23	7	1	1
Worcester,	136,476	41	7	21	14	3	1	1	–
Fall River,	106,486	32	6	9	2	2	–	1	–
Cambridge,	102,112	39	8	23	17	5	–	–	–
Lowell,	96,380	48	13	24	17	4	1	–	1
New Bedford,	85,516	36	16	8	7	–	1	–	–
Lynn,	84,623	24	6	10	6	2	2	–	–
Springfield,	84,237	28	7	8	5	2	1	–	–
Lawrence,	78,000	35	18	9	7	–	–	–	–
Somerville,	76,049	25	2	9	3	2	3	–	–
Brockton,	55,039	11	2	3	–	–	1	–	–
Holyoke,	53,590	15	8	8	4	2	–	–	–
Malden,	41,941	14	3	1	1	–	–	–	–
Chelsea,	40,080	11	3	3	–	1	–	–	–
Newton,	39,642	9	2	3	3	–	–	–	–
Salem,	39,019	22	5	5	4	1	–	–	–
Haverhill,	38,362	14	5	5	1	2	–	–	–
Fitchburg,	34,263	7	3	2	1	1	–	–	–
Everett,	33,597	11	1	2	–	1	–	–	–
Quincy,	31,937	6	3	1	1	–	–	–	–
Taunton,	30,967	24	2	9	6	1	–	–	–
Waltham,	28,761	6	0	2	1	–	1	–	–
Pittsfield,	27,932	9	–	2	2	–	–	–	–
Brookline,	26,674	7	–	2	2	–	–	–	–
Gloucester,	26,011	7	1	2	2	–	–	–	–
North Adams,	22,150	7	3	3	2	–	–	–	–
Northampton,	21,075	3	1	–	–	–	–	–	–
Chicopee,	21,049	9	1	4	3	–	–	–	–
Medford,	20,921	7	2	5	2	2	1	–	–
Beverly,	16,386	1	–	1	–	1	–	–	–
Leominster,	16,030	2	–	–	–	–	–	–	–
Hyde Park,	15,609	9	4	5	4	–	–	–	–
Melrose,	15,459	6	1	4	3	–	–	–	–
Newburyport,	14,834	2	1	2	2	–	–	–	–
Revere,	14,820	3	1	–	–	–	–	–	–
Westfield,	14,750	5	–	1	–	1	–	–	–
Woburn,	14,522	2	0	1	–	1	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	4	2	1	–	–	–	–	–
Attleborough,	13,913	4	2	3	2	–	–	–	1
Adams,	13,685	5	3	1	1	–	–	–	–
Clinton,	13,105	2	0	1	–	1	–	–	–
Gardner,	13,066	5	0	2	1	1	–	–	–
Milford,	12,722	4	3	–	–	–	–	–	–
Watertown,	12,676	3	1	3	2	1	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	2	1	1	–	–	–	–	1
Weymouth,	11,798	2	0	–	–	–	–	–	–
Framingham,	11,749	5	0	2	1	1	–	–	–
Wakefield,	11,124	5	–	–	–	–	–	–	–
Webster,	11,109	4	4	–	–	–	–	–	–
Arlington,	10,520	2	–	–	–	–	–	–	–
Greenfield,	10,140	1	–	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,401,701	853	206	308	177	61	19	3	4

WEEK ENDING JAN. 15, 1910.

CITIES AND TOWNS.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM—					
				Principal Infectious diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	237	55	78	45	19	1	–	2
Worcester,	136,476	28	6	9	8	–	1	–	–
Fall River,	106,486	30	8	9	4	1	–	–	–
Cambridge,	102,112	28	10	12	3	3	–	–	–
Lowell,	96,380	45	12	16	10	2	1	1	1
New Bedford,	85,516	18	8	5	4	–	–	–	–
Lynn,	84,623	24	2	7	6	1	–	–	–
Springfield,	84,237	37	10	15	7	3	1	–	–
Lawrence,	78,000	34	11	16	8	4	2	–	–
Somerville,	76,049	33	7	13	7	3	1	–	–
Brockton,	55,039	10	2	4	3	–	–	1	–
Holyoke,	53,590	19	6	9	5	–	1	–	–
Malden,	41,941	13	3	4	2	1	–	–	–
Chelsea,	40,080	6	2	1	1	–	–	–	–
Newton,	39,642	13	1	2	2	–	–	–	–
Salem,	39,019	14	–	5	–	5	–	–	–
Haverhill,	38,362	15	1	3	2	1	–	–	–
Fitchburg,	34,263	8	3	3	1	1	–	1	–
Everett,	33,597	3	1	–	–	–	–	–	–
Quincy,	31,937	3	1	–	–	–	–	–	–
Taunton,	30,967	13	4	7	5	–	1	–	–
Waltham,	28,761	6	0	3	2	1	–	–	–
Pittsfield,	27,932	8	–	3	1	1	–	–	–
Brookline,	26,674	8	1	2	2	–	–	–	–
Gloucester,	26,011	9	3	–	–	–	–	–	–
North Adams,	22,150	7	3	3	1	–	–	1	–
Northampton,	21,075	6	–	2	1	1	–	–	–
Chicopee,	21,049	5	2	2	1	1	–	–	–
Medford,	20,921	10	1	4	3	1	–	–	–
Beverly,	16,386	4	1	1	–	–	1	–	–
Leominster,	16,030	3	2	1	1	–	–	–	–
Hyde Park,	15,609	8	2	3	1	1	1	–	–
Melrose,	15,459	5	0	1	1	–	–	–	–
Newburyport,	14,834	4	–	–	–	–	–	–	–
Revere,	14,820	2	1	1	1	–	–	–	–
Westfield,	14,750	2	–	–	–	–	–	–	–
Woburn,	14,522	2	0	1	1	–	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	5	2	–	–	–	–	–	–
Attleborough,	13,913	2	0	–	–	–	–	–	–
Adams,	13,685	7	1	1	–	–	–	–	–
Clinton,	13,105	5	2	1	–	–	1	–	–
Gardner,	13,066	5	0	2	1	–	–	–	–
Milford,	12,722	8	1	3	3	–	–	–	–
Watertown,	12,676	3	2	1	–	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	4	2	2	1	1	–	–	–
Weymouth,	11,798	0	–	–	–	–	–	–	–
Framingham,	11,749	4	0	1	1	–	–	–	–
Wakefield,	11,124	1	–	–	–	–	–	–	–
Webster,	11,109	2	2	1	–	–	–	–	1
Arlington,	10,520	4	–	2	2	–	–	–	–
Greenfield,	10,140	1	–	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,401,701	771	181	259	147	51	12	4	4

Week ending Jan. 22, 1910.

Cities and Towns.	Population Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	Deaths from— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	255	55	92	42	27	5	2	2
Worcester,	136,476	47	14	12	2	4	5	–	1
Fall River,	106,486	35	23	13	7	2	–	–	–
Cambridge,	102,112	30	6	16	9	5	–	–	–
Lowell,	96,380	50	18	16	11	2	2	–	–
New Bedford,	85,516	47	22	18	12	2	1	–	–
Lynn,	84,623	26	5	12	9	2	–	1	–
Springfield,	84,237	33	10	10	5	1	1	–	–
Lawrence,	78,000	32	10	17	11	2	–	–	2
Somerville,	76,049	26	5	8	3	2	–	–	–
Brockton,	55,039	9	1	4	1	2	–	–	–
Holyoke,	53,590	22	9	7	2	2	–	–	–
Malden,	41,941	13	–	5	3	2	–	–	–
Chelsea,	40,080	13	1	2	2	–	–	–	–
Newton,	39,642	16	1	4	3	1	–	–	–
Salem,	39,019	8	1	4	3	–	–	–	–
Haverhill,	38,362	12	1	8	5	3	–	–	–
Fitchburg,	34,263	8	4	4	3	–	1	–	–
Everett,	33,597	8	1	1	–	1	–	–	–
Quincy,	31,937	8	1	4	3	1	–	–	–
Taunton,	30,967	19	4	9	5	1	–	–	–
Waltham,	28,761	19	1	8	3	1	2	–	–
Pittsfield,	27,932	9	–	5	4	–	–	–	–
Brookline,	26,674	8	–	2	2	–	–	–	–
Gloucester,	26,011	4	–	1	–	1	–	–	–
North Adams,	22,150	3	1	2	–	2	–	–	–
Northampton,	21,075	9	1	2	1	1	–	–	–
Chicopee,	21,049	8	1	3	3	–	–	–	–
Medford,	20,921	8	1	5	4	–	–	–	–
Beverly,	16,386	7	1	1	1	–	–	–	–
Leominster,	16,030	9	2	6	3	1	1	–	–
Hyde Park,	15,609	8	2	1	–	1	–	–	–
Melrose,	15,459	1	0	–	–	–	–	–	–
Newburyport,	14,834	5	–	–	–	–	–	–	–
Revere,	14,820	4	2	1	1	–	–	–	–
Westfield,	14,750	5	–	2	1	1	–	–	–
Woburn,	14,522	7	2	3	2	–	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	4	0	–	–	–	–	–	–
Attleborough,	13,913	5	0	2	1	1	–	–	–
Adams,	13,685	2	2	–	–	–	–	–	–
Clinton,	13,105	6	2	2	1	–	1	–	–
Gardner,	13,066	6	2	2	1	–	–	–	–
Milford,	12,722	3	0	2	2	–	–	–	–
Watertown,	12,676	6	2	2	1	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	4	2	–	–	–	–	–	–
Weymouth,	11,798	6	0	2	2	–	–	–	–
Framingham,	11,749	7	1	3	2	1	–	–	–
Wakefield,	11,124	3	–	–	–	–	–	–	–
Webster,	11,109	2	–	–	–	–	–	–	–
Arlington,	10,520	5	–	2	1	1	–	–	–
Greenfield,	10,140	3	–	1	–	1	–	–	–
Recapitulation.									
Total of reporting towns,	2,401,701	893	217	326	177	74	19	3	5

WEEK ENDING JAN. 29, 1910.

CITIES AND TOWNS.	Population. Estimated for 1909	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	232	55	87	42	28	4	–	2
Worcester,	136,476	47	9	19	12	5	1	–	–
Fall River,	106,486	47	12	17	8	3	–	–	–
Cambridge,	102,112	37	8	24	10	6	2	–	–
Lowell,	96,380	30	8	13	9	2	1	–	1
New Bedford,	85,516	28	14	17	10	5	–	–	–
Lynn,	84,623	24	2	6	6	–	–	–	–
Springfield,	84,237	21	4	12	5	1	2	–	–
Lawrence,	78,000	34	18	15	6	3	1	–	–
Somerville,	76,049	28	5	10	8	1	1	–	–
Brockton,	55,039	15	3	5	2	3	–	–	–
Holyoke,	53,590	29	12	14	4	3	–	–	2
Malden,	41,941	8	1	2	–	2	–	–	–
Chelsea,	40,080	5	0	–	–	–	–	–	–
Newton,	39,642	11	2	3	3	–	–	–	–
Salem,	39,019	16	–	6	1	5	–	–	–
Haverhill,	38,362	14	–	5	2	2	1	–	–
Fitchburg,	34,263	9	2	–	–	–	–	–	–
Everett,	33,597	5	3	1	–	–	1	–	–
Quincy,	31,937	8	1	3	2	1	–	–	–
Taunton,	30,967	16	2	8	5	1	–	–	–
Waltham,	28,761	12	3	3	3	–	–	–	–
Pittsfield,	27,932	13	2	4	3	1	–	–	–
Brookline,	26,674	8	–	–	–	–	–	–	–
Gloucester,	26,011	7	3	–	–	–	–	–	–
North Adams,	22,150	4	–	2	–	2	–	–	–
Northampton,	21,075	10	1	1	–	–	–	–	–
Chicopee,	21,049	3	2	2	2	–	–	–	–
Medford,	20,921	2	–	–	–	–	–	–	–
Beverly,	16,386	1	–	–	–	–	–	–	–
Leominster,	16,030	3	1	2	2	–	–	–	–
Hyde Park,	15,609	4	1	–	–	–	–	–	–
Melrose,	15,459	6	1	2	2	–	–	–	–
Newburyport,	14,834	7	–	2	2	–	–	–	–
Revere,	14,820	3	1	1	–	–	–	–	–
Westfield,	14,750	7	1	2	1	1	–	–	–
Woburn,	14,522	3	0	1	1	–	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	6	0	2	–	2	–	–	–
Attleborough,	13,913	3	1	2	2	–	–	–	–
Adams,	13,685	1	–	1	1	–	–	–	–
Clinton,	13,105	4	1	2	2	–	–	–	–
Gardner,	13,066	9	2	4	–	3	–	–	–
Milford,	12,722	5	1	1	–	1	–	–	–
Watertown,	12,676	2	1	–	–	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	4	–	2	1	1	–	–	–
Weymouth,	11,798	4	2	2	2	–	–	–	–
Framingham,	11,749	4	1	2	2	–	–	–	–
Wakefield,	11,124	1	–	1	1	–	–	–	–
Webster,	11,109	1	–	–	–	–	–	–	–
Arlington,	10,520	2	–	1	–	1	–	–	–
Greenfield,	10,140	4	–	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,401,701	807	186	309	162	83	14	–	5

WEEKLY RETURNS OF DEATHS FROM CERTAIN INFECTIOUS DISEASES.

DEATHS FROM INFECTIOUS DISEASES NOT SPECIFICALLY MENTIONED IN ABOVE TABLES DURING THE WEEKS OF JAN. 1, 8, 15, 22 AND 29, 1910.

DISEASE.	Place.	WEEK ENDING—				
		Jan. 1.	Jan. 8.	Jan. 15.	Jan. 22.	Jan. 29.
Cerebro-spinal meningitis,	Boston,	1	3	4	–	–
	Brockton,	–	1	–	–	–
	Fall River,	–	–	–	–	1
	Quincy,	1	–	–	–	–
	Worcester,	1	1	–	–	1
Scarlet fever,	Boston,	1	–	–	1	1
	Brockton,	–	–	–	1	–
	Everett,	1	1	–	–	–
	Haverhill,	1	–	–	–	–
	Lawrence,	–	1	–	–	–
	Marlborough,	–	1	–	–	–
	Springfield,	2	–	2	1	–
Whooping cough,	Boston,	–	–	1	1	1
	Cambridge,	–	–	–	–	1
	Fall River,	–	–	–	1	–
	Haverhill,	–	1	–	–	–
	Holyoke,	–	–	–	1	1
	Malden,	–	–	1	–	–
	New Bedford,	–	–	–	1	–
	Pittsfield,	–	–	1	–	–
	Somerville,	1	–	–	–	–
	Taunton,	–	–	–	1	–
	Worcester,	–	1	–	–	–
Erysipelas,	Boston,	–	1	–	3	–
	Cambridge,	–	–	1	–	1
	Holyoke,	–	–	–	–	1
	Lawrence,	1	–	–	–	–
	Northampton,	–	–	–	–	1
	Somerville,	–	–	1	–	–
	Waltham,	–	–	–	1	–
Tuberculosis other than pulmonary.	Adams,	–	–	1	–	–
	Boston,	2	3	4	1	6
	Brockton,	1	1	–	–	–
	Cambridge,	1	–	1	2	1
	Chelsea,	–	1	–	–	–
	Chicopee,	–	1	–	–	–
	Fall River,	–	–	–	–	1
	Gardner,	–	–	1	1	1
	Holyoke,	–	–	–	–	2
	Lawrence,	–	–	–	1	–
	Leominster,	–	–	–	1	–
	Lowell,	–	1	–	1	–

DEATHS FROM INFECTIOUS DISEASES, ETC. — *Concluded.*

DISEASE.	Place.	WEEK ENDING— Jan. 1.	Jan. 8.	Jan. 15.	Jan 22	Jan. 29.
Tuberculosis other than pulmonary — *Con.*	Melrose,	–	1	–	–	–
	New Bedford,	1	–	–	1	–
	North Adams,	–	–	1	–	–
	Pittsfield,	–	–	–	1	–
	Revere,	–	–	–	–	1
	Salem,	–	–	–	1	–
	Somerville,	–	–	1	1	–
	Taunton,	1	–	–	–	–
	Woburn,	1	–	–	1	–
Influenza,	Attleborough,	1	–	–	–	–
	Boston,	1	4	–	2	–
	Cambridge,	1	–	1	–	1
	Lowell,	–	–	1	–	–
	Medford,	–	–	–	1	–
	Northampton,	1	–	–	–	–
	Springfield,	–	–	1	1	1
	Taunton,	–	1	1	–	–
	Waltham,	–	–	–	1	–
Meningitis other than cerebro-spinal.	Watertown,	–	–	1	1	–
	Wakefield,	–	–	1	–	–
Tetanus,	Springfield,	–	–	–	1	–

WEEKLY RETURNS OF CASES OF INFECTIOUS DISEASES.

CASES OF INFECTIOUS DISEASES REPORTED DURING THE WEEKS OF Jan. 1, 8, 15, 22 and 29, 1910.

[Under the provisions of section 52 of chapter 75 of the Revised Laws.]

	WEEK ENDING— Jan. 1.	Jan. 8	Jan. 15.	Jan. 22.	Jan. 29.	Total.
Diphtheria,	196	185	157	184	190	912
Measles,	279	288	329	442	434	1,772
Scarlet fever,	177	173	206	176	211	943
Typhoid fever,	34	29	27	21	21	132
Tuberculosis, pulmonary,	158	128	143	140	185	754
Tuberculosis other than pulmonary,	–	1	1	1	–	3
Cerebro-spinal meningitis,	8	3	5	6	2	24
Whooping cough,	12	37	15	23	18	115
Varicella,	55	77	91	92	105	420
Erysipelas,	3	1	1	2	–	7
Mumps,	1	3	–	2	1	7
Ophthalmia neonatorum,	2	5	2	3	1	13
Smallpox,	8	12	27	13	47	107
Tetanus,	1	–	1	–	–	2
Anterior poliomyelitis,	2	2	1	–	5	10

MONTHLY REPORT ON INSPECTION OF FOOD AND DRUGS.

The following summary presents the results of the examination of food and drugs made by the State Board of Health during the month of January, 1910: —

Articles examined.	Number found to be of Good Quality.	Number adulterated or varying from the Legal Standard.	Total.	Articles examined.	Number found to be of Good Quality.	Number adulterated or varying from the Legal Standard.	Total.
Butter,	20	3	23	Meat products — *Con.*: —			
Cheese,	4	–	4	Poultry,	1	–	1
Cider,	1	–	1	Pressed meat,	3	–	3
Confectionery,	1	–	1	Sausages,	13	–	13
Cream,	10	2	12	Tripe,	2	–	2
Cream of tartar,	–	1	1	Molasses,	1	–	1
Dried fish,	1	–	1	Olive oil,	6	2	8
Drugs,	53	21	74	Potato salad,	1	–	1
Flavoring extracts,	11	2	13	Proprietary foods,	1	1	2
Honey,	3	–	3	Pickles,	13	–	13
Horse-radish,	2	–	2	Salad dressing,	1	–	1
Jams and jellies,	7	–	7	Salad oil,	1	–	1
Lard,	1	–	1	Shrimp,	1	–	1
Malt liquors,	3	–	3	Syrup,	1	–	1
Maple sugar,	1	–	1	Table sauce,	1	–	1
Maple syrup,	1	–	1	Vinegar,	2	1	3
Milk,	286	36	322	Wine,	21	5	26
Meat products: —							
Hamburg steak,	4	1	5	Total,	481	75	556
Mince meat,	3	–	3				

The samples of drugs found to be adulterated were: spirit of anise, spirit of camphor, spirit of peppermint and a proprietary medicine.

The cities and towns in which samples were collected were: Bellingham, Boston, Brockton, Cambridge, Chelsea, Clinton, Danvers, Dedham, Dudley, Everett, Fall River, Hyde Park, Ipswich, Lynn, Malden, Marblehead, Melrose, New Bedford, Newton, Peabody, Quincy, Rowley, Salem, Somerville, South Framingham, Waltham, Watertown, Webster, Whitman, Woburn and Worcester.

PROSECUTIONS FOR VIOLATIONS OF THE LAW RELATING TO FOOD AND DRUGS.

Nineteen convictions were secured during the month of January, 1910, for selling adulterated food and drugs, as follows: —

No.	Name of Defendant.	Place.	Character of Article sold.
1	Alixis Bragg,	Worcester,	Butter.[1,2]
2	William E. Megett,	Worcester,	Butter.[1,2]
3	William E. Megett,	Worcester,	Butter.[1,2]
4	James E. Johnson,	Fall River,	Butter.[1]
5	George W. Maxim,	Brockton,	Hamburg steak.[3]
6	Harry G. Snow (with the Mohican Co.),	Brockton,	Hamburg steak.[3]
7	Louis Louison,	Fall River,	Lard.[4]
8	Newton A. Clark,	Warren,	Milk (total solids, 11 84).
9	Lewis S. Hardy,	Waltham,	Milk (total solids, 10 60).[5]
10	H. P. Hood & Sons,	Charlestown,	Milk (skimmed, can unmarked).
11	John Monaghan, Jr.,	Newton,	Milk (total solids, 10.48).[2,5]
12	Delmar H. Morse,	Gardner,	Milk (skimmed) (total solids, 9 50).
13	Otto Reich,	Webster,	Milk (total solids, 10 30).
14	Otto Reich,	Webster,	Milk (total solids, 9.99).[5]
15	Jacob Wieloch,	Dudley,	Milk (total solids, 11.55).
16	Jacob Wieloch,	Dudley,	Milk (total solids, 11.55).[5]
17	Dominico P. Araldo,	Brockton,	Olive oil (33% cotton-seed oil).
18	E. A. Carlson,	Brockton,	Spirit of anise (63.2 U. S. P.)
19	Arthur L. Gavin,	Boston,	Tincture of ginger.[2]

[1] Oleomargarine sold as butter. [2] Appealed. [3] Contained sulphurous acid.
[4] Contained cotton-seed oil. [5] Watered.

Fines imposed, $690.

LIST OF ADULTERATED OR IMPROPERLY LABELLED FOODS, ETC., FOR JANUARY, 1910.

Number of Sample.	Character of Sample.	Name of Manufacturer, Wholesaler or Producer.	Results of Analyses.
11135	Compound orange extract.	Strohmeyer & Arpe Company, New York City, N. Y.,	No orange oil present.
3435 R	Olive oil,	Olio D'oliva, R. Antionotti Lucca, Genoa, Italy,	Contained 40 per cent. cotton-seed oil.
3289 R	Pure wine vinegar,	Savoy Wine and Importing Company, Boston, Mass.,	Low in acid.
11116	Spirit of anise,	C. R. Hillberg & Co., Brockton and Campello, Mass.,	25 per cent. U. S. P. strength.
11171	Spirit of anise,	Hall & Lyon Company, Brockton, Mass.,	58 per cent. U. S. P. strength.
11172	Spirit of anise,	Bixby Drug Store, Brockton, Mass ,	35 per cent. U. S. P. strength.
11173	Spirit of anise,	M. B. Crowell & Co., Brockton, Mass.,	59 per cent. U. S. P. strength.
11170	Spirit of anise,	Blake's Pharmacy, Brockton, Mass.,	63 per cent. U. S. P. strength.
3389 R	Spirit of anise,	Chas. C Hearn, Quincy, Mass.,	63 per cent. U. S. P. strength.
11180	Spirit of peppermint,	Wm. L. Davis, Druggist and Apothecary, Worcester, Mass.	69.5 per cent. U. S. P. strength.
3854 N	Milk,	Samuel D. Allen, Bellingham, Mass.,	Total solids, 10.73 per cent.; fat, 3.00 per cent.; contained added water.
3858 N	Milk,	Samuel D. Allen, Bellingham, Mass.,	Total solids, 6.00 per cent.; fat, 1.35 per cent.; contained added water.
q 4313	Milk,	George Poulin, Cambridge, Mass.,	Total solids, 11.38 per cent.; fat, 2.50 per cent.; proteid, 3.28 per cent.; skimmed milk.
q 4317	Milk,	A. Hannaford & Co., Waverley, Mass.,	Total solids, 11.90 per cent.; fat, 2.70 per cent.; proteid, 3.57 per cent.; skimmed milk.
3339 R	Milk,	H. P. Hood & Sons, Boston, Mass.,	Total solids, 9.70 per cent.; fat, 0.10 per cent.; skimmed milk.
3341 R	Milk,	H. P. Hood & Sons, Boston, Mass.,	Total solids, 9.66 per cent.; fat, 0.10 per cent.; skimmed milk.

INSPECTION OF DAIRIES.

During the month of January, 1910, 106 dairies supplying milk for public sale in Massachusetts were examined, of which 13 are situated in New Hampshire. The Massachusetts dairies yielded the following data: —

Place.	Number examined.	Number found to present no Objectionable Features.	Per Cent.	Number concerning which Letters were sent.	Per Cent.
East Bridgewater,	1	–	–	1	100.00
Second inspection,	31	28	90.32	3	9.68
Quincy,	10	9	90.00	1	10.00
Second inspection,	19	11	57.89	8	42.11
Rutland,	–	–	–	–	–
Second inspection,	12	11	91.67	1	8.33
Sherborn,	2	2	100.00	–	–
Second inspection,	16	11	68.75	5	31.25
Stoneham,	1	–	–	1	100.00
Second inspection,	1	–	–	1	100.00

Total number of dairies examined (including those in New Hampshire),	106
Number found to be free from objectionable conditions,	72
Number concerning which letters were sent,	34
Total number of conditions to which attention was called,	145
Percentage of dairies which passed inspection,	67.92

In addition to the above, 70 dairies were visited at which the sale of milk had been discontinued.

The names of the owners of the dairies in Massachusetts found to be worthy of commendation follow: —

East Bridgewater.

Averill, Edward *†
Blanchard, Augustus *
Costello, Thomas *
Curran, Dennis *
Eddie, A.*†
Ellis, Oscar *
Goodwin, George A.*†
Harding, Charles *
Harlow & Leland *
Hill, Benjamin *
Jenkins, Z. A.*
Keith & Parker *†
Kelley, Albert L.
Kennelley, Edward *†
Latham, A. Harris *
Lindskog, O.*
Mahoney, Daniel *†
Morehouse, Daniel *†
Pratt & Shaw *†
Pratt, Walter S.*
Settleland, John *†
Seymour, N. H.*†
Sherman, Henry *†
Smith, Thomas *
Sturgis, Mrs. Mary *
Washburn & Washburn *†
White, Thomas *†
Willis, Gayland *†

Quincy.

Arnold, D. W.
Barlow, W. J.*
Bowen, F. L.
Brown, Mary J.
Finn, Edward B.*†
Frederickson, Mary
Hunter, C. E.*†
Johnson, Charles
Johnson, Robert
Kennard, H. G.*
Lord, Mrs. M. R.*
Lunt, John *
National Sailors Home *†
Nowlands, J M.*†
Paradise, Mrs. Thomas
Patten, G. W.
Pawsee, George
Raymond, Mrs. W. T.*
Taylor, Estate of G. W.*†
White, A.*

* Second inspection. † Reported favorably on first inspection.

Rutland.

Calkins, Henry*	LaTowne, D.*	Rice, George*
Cullen, M. J.*	O'Herran, Dennis*	Taylor, George*
Davis, H. J.*	Potter, B. W. & Son *†	Welch, John J.*
Delehanty, P.*†	Prescott, R.*	

Sherborn.

Adams, A. H.*	Gardner. J. E.	Thompson W. B.*
Bean, C. A.*†	Hodge, W. H. Jr.*†	Whitney, Daniel*
Crane, H. A.*	Merriam, J.*†	Whitney, George L.*†
Davis, G. W.*	Stratton, J. H.*	
Fitts, George	Sylvester, F. A.*	

* Second inspection. † Reported favorably on first inspection.

New Hampshire Dairies.

Place.	Number examined.	Number found to present no Objectionable Features.	Per Cent.	Number concerning which Letters were sent.	Per Cent.
Fitzwilliam,	1	–	–	1	100.00
Walpole,	7	–	–	7	100.00
Westmoreland,	5	–	–	5	100.00

Total number of dairies examined, ... 13
Number found to be free from objectionable conditions, ... –
Number concerning which letters were sent, ... 13
Total number of conditions to which attention was called, ... 48

ORIGIN AND PREVALENCE OF TYPHOID FEVER IN BOSTON IN THE YEAR 1909.

By Donald Gregg, M.D., *Agent of the State Board of Health, Charles Follen Folsom Fellow in Hygiene, Harvard Medical School.*

Introduction.

The work upon which the following report concerning typhoid fever in Boston during the year 1909 is based was begun August 15, and continued until the close of the year. The thanks of the investigator are due to Dr. Mark W. Richardson, secretary of the State Board of Health, and to Dr. M. J. Rosenau, Professor of Preventive Medicine at the Harvard Medical School, for their advice and assistance; and to the officials of the boards of health of Boston and adjacent cities for their courtesy in furnishing information concerning the reported cases. Finan-

cial assistance in carrying on the work was obtained from the State Board of Health and from the Charles Follen Folsom Fellowship in Hygiene of the Harvard Medical School.

At first the object of the investigator was to study the cases in as complete detail as possible, but the carrying out of this intention soon proved to be impossible, owing, first, to the magnitude of the problems that were uncovered in the process of the investigation; second, to the attempt of the investigator to study, simultaneously with the Boston cases, various outbreaks of typhoid fever in other parts of the State; and third, to the investigator's inability, owing to his departure from Boston, to complete the study of several small local epidemics, of suspected "typhoid houses" and suspected "typhoid carriers."

This report is to be considered merely as a preliminary survey of the problem. Further study of the situation, in the opinion of the investigator, should be undertaken by a single individual, qualified to spend his whole time studying the origin and prevalence of typhoid fever throughout the State.

Method.

The office of the Boston board of health was first visited. Here was obtained the name, address and age of the individual reported as being sick with typhoid fever. Here, also, was learned the name of the doctor making the report and the date of the notice. This information was recorded upon a typhoid fever case card, devised as follows: —

Name, Age, Res., Ward,

Birthplace, Duration of Residence, Occupation,

Reported by Date,

F.H. F. M. B. B.* S. S *

Children, Neighbors,

P.H.

Water, Milk, Veg., Fish,

Gen. Hyg., Sewerage,

P.I. Date of Onset, Duration,

Complications, Result,

P. S. I.

Present Res.

Present Occup.

An explanation of some of the abbreviations may be advisable.

Under "F. H." (family history) are spaces for recording information concerning members of the patient's family, the father ("F."), mother, brothers and sisters, the brothers and sisters dead ("B.*", "S.*"), children and neighbors. The information here recorded concerned largely the present or past existence of typhoid cases and their relationship to the patient, as possible evidence of the source of the infection of the case in hand. Under "P. H." (past history) were recorded the recent activities of the individual, — date of his return to the city, etc. The sources of articles of food injested were next noted. Under "Gen. Hyg." were noted briefly the conditions favoring contact infection — filthy tenements, flies, etc. Most of the other items are self-explanatory. Under "P. S. I." was noted briefly the probable source of infection, — whether from milk, water, shellfish, contact; whether of local or imported origin, etc.

Another and a better card is the following one, used by the investigators of the typhoid fever situation in Washington, D. C. This card is better adapted for permanent records.

TYPHOID FEVER CASE CARD.

Date of investigation, Case No.
Name,
Age, Color, Sex, Nationality,
Probable date of onset, Date definite symptoms,
Name and address of physician,

Residence.

How long resident in District of Columbia,
Residence when taken sick, ; from to
Previous residences, ; from to
Subsequent residences, ; from to
Temporary absences from District of Columbia within thirty days prior,
Number of occupants, ; ages,
Number of occupants who have had typhoid, ; when,
Newcomers in house within three months prior,
Newcomers in house had typhoid?
Servants:
White: Resident, Typhoid?
Nonresident, Typhoid?
Colored: Resident, Typhoid?
Nonresident, Typhoid?
Typhoid at homes of servants? When?

Disposal of sewage, Water-closet in house?
Water-closet in yard? Privy? Location?
General sanitary condition of residence,

Occupation.

Place, ; from to
Other cases,

Water.

Within thirty days prior, Solely, Principally,
Occasionally,

Food.

Within thirty days prior,
Where taken,
Milk (how used), ; from Boiled? Pasteurized?
Ice cream? Where?
Uncooked fruits and vegetables,
Shellfish,

Contact.

Association thirty days prior with patients in febrile stage,
Association with suspected cases,
Association with persons who have had typhoid within six months, ; one year, ; two years, ; three years, ; four years, ; five years,
Association thirty days prior with persons in contact with patients in febrile stage,
Treatment of stools and urine of patients,
Other precautions,
Remarks:
Summary:

Signature:

Having obtained the preliminary information of the name, address, etc., from the Board of health office, the investigator then looked up the case, and obtained, when possible, the additional information desired. This information was obtained most often from the individual himself, or from members of the family or friends. In some cases the attending physician kindly furnished the information. Especial thanks are due to the officials of hospitals, where many of the cases were treated, for their courtesy in giving information concerning the patients, and in permitting them to be visited.

In many cases, owing to the lapse of time between the report of the case and its investigation, or to other reasons, only a partial report could

be obtained. The following tables and percentages are, therefore, at times based on incomplete data. There is no reason for believing, however, that complete returns would modify the conclusions drawn.

The report of the cases by months is shown in the following table. Any discrepancy between these tables and those of the Boston board of health is due to the fact that certain cases were reported by both the attending physician and the hospital to which the case was later sent, and are thus sometimes counted twice in the Boston lists. Together with the reported cases are noted unlisted cases, *i.e.*, cases not upon the Boston lists, which were either not recorded or noted merely as questionable cases and not verified.

Reported and Unlisted Cases.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
Reported, . .	51	11	24	22	26	33	33	70	142	134	70	42	658
Not listed, . .	7	–	3	–	3	5	6	7	4	2	–	3	40
Totals, . .	58	11	27	22	29	38	39	77	146	136	70	45	698

Diagnosis.

In most cases the diagnosis as made by the attending physician was accepted as final. No attempt was made, without the physician's consent and assistance, to verify the diagnosis by blood cultures or Widal reactions. The investigator was ready to assist the attending physician with these tests, but in the majority of cases such tests would have been made too late to have been of any clinical value. Many cases were reported as typhoid fever without a Widal or blood culture test having been made, and quite a number of these cases were probably wrongly diagnosed. Oftentimes cases reported as typhoid fever were sent to the hospitals and there otherwise diagnosed. These cases are classed as "false hospital cases" in the accompanying table. Cases not sent to the hospital, where the subsequent clinical history showed clearly a condition other than typhoid fever, are grouped as "false home cases."

False Cases.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
Home, . . .	2	–	1	4	2	4	–	4	3	4	4	5	33
Hospital, . .	10	4	10	7	5	8	11	10	10	11	10	10	106
Totals, . .	12	4	11	11	7	12	11	1	13	15	14	15	139

Of the false cases, 106, or 76 per cent., were hospital cases, 36, or 24 per cent., home cases. The distribution of the false home and hospital cases by months and wards is shown in the following tables: —

False Home Cases.

	Wards.																								Extraneous.	Totals.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25		
January, .	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2
February, .	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
March, . .	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
April, . .	–	–	–	–	–	2	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	1	–	–	–	–	4
May, . .	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	2
June, . .	1	2	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4
July, . .	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
August, . .	–	–	–	–	1	1	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	1	–	–	4
September, .	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	3
October, .	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	1	–	–	1	–	–	1	–	4
November, .	–	–	–	–	–	3	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	4
December, .	–	–	–	1	–	1	1	–	–	–	–	–	1	–	–	–	–	–	–	–	–	1	–	–	–	–	5
Totals, .	1	2	1	1	1	10	1	4	–	–	–	1	1	–	–	2	–	1	1	–	4	–	1	1	–	–	33

False Hospital Cases.

	Wards.																								Extraneous.	Totals.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25		
January, .	–	1	–	–	–	–	–	–	2	2	–	1	–	1	1	–	1	1	–	–	–	–	–	–	–	–	10
February, .	–	–	–	–	–	1	–	–	1	–	–	–	–	–	–	–	–	–	1	–	–	1	–	–	–	–	4
March, . .	–	1	1	1	–	–	–	–	–	1	–	1	–	–	–	–	1	1	–	–	1	–	–	2	–	–	10
April, . .	–	–	–	–	1	1	–	–	2	–	–	–	–	1	–	–	–	–	–	–	–	2	–	–	–	–	7
May, . .	–	–	–	–	–	1	–	–	–	1	–	–	–	–	1	–	–	–	–	–	1	–	1	–	–	–	5
June, . .	–	–	–	1	–	3	–	–	1	–	–	–	–	1	–	–	2	–	–	–	–	–	–	–	–	–	8
July, . .	–	–	–	–	1	–	1	–	–	–	–	1	1	1	1	2	–	–	–	1	–	1	–	–	1	–	11
August, . .	1	1	–	–	1	–	2	–	–	–	–	–	–	–	–	1	1	1	–	1	–	–	–	1	–	–	10
September, .	–	–	1	–	3	1	–	–	–	–	–	1	–	1	–	1	–	–	–	1	–	–	–	–	1	–	10
October, .	1	1	2	–	–	–	–	1	3	2	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	11
November, .	–	1	1	–	–	–	–	–	–	–	–	1	–	–	–	2	–	–	–	–	2	–	–	2	1	–	10
December, .	–	–	–	–	–	2	–	2	–	1	–	–	–	1	–	1	1	–	–	1	–	1	–	–	–	–	10
Totals, .	2	5	5	2	6	9	3	3	9	7	–	5	1	6	3	7	6	3	1	5	4	5	1	5	3	–	106

Of 698 reported or unlisted cases, 416 received hospital treatment. Out of these 416, 106, or 25 per cent., were not typhoid fever. Two hundred and eighty-two cases were treated at home; 33, or 12 per cent., of these cases were considered not to be typhoid fever. More careful investigation of the home cases would probably have shown a larger percentage of false home cases.

The distribution of the cases by wards reflects slightly the local conditions.

The list of diseases considered and reported to be typhoid fever is as follows: febricula, 24; pneumonia, 19; malaria, 10; tuberculosis, 9; no diagnosis, 9; influenza, 8; bronchitis, 7; appendicitis, 4; enteritis, 4; meningitis, 4; pleurisy, 3; pyelitis, 3; anterior poliomyelitis, 3; endocarditis, 3; cirrhosis of liver, 2; empyema, 2; mastitis, 2; and 1 case each of kidney abscess, secondary anæmia, exophthalmic goiter, syphilis, gastritis, tumor of kidney, liver abscess, scarlet fever, pneumo-thorax, orchitis, mitral disease, salpingitis, peritonitis, erythema multiforme, fractured skull, infectious arthritis, malignant endocarditis, lumbago, otitis media, laryngitis, Cowperitis, alcoholism, phlebitis, myositis and perinephritis.

The waste of health, time and life resulting from the treatment of malaria, appendicitis, tuberculosis and poliomyelitis as typhoid fever hardly needs comment.

In the following table are shown the "true cases," distributed by months and wards. The list was obtained by subtracting the false cases from the reported ones, and adding thereto the unlisted cases.

True Cases.

	Wards.																									Extraneous.	Totals.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25		
January,	–	1	2	–	–	3	1	5	4	2	–	3	3	4	2	3	2	4	–	3	–	–	2	–	1	1	46
February,	1	–	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1	–	1	7
March,	1	4	1	–	–	2	–	–	–	–	–	–	–	–	2	–	–	1	–	–	1	4	–	–	–	–	16
April,	–	1	–	–	1	1	–	–	–	–	–	–	1	–	1	–	1	–	–	–	–	3	1	–	–	1	11
May,	1	3	–	3	–	2	1	–	1	1	–	2	–	2	1	–	–	–	–	1	–	1	–	2	–	1	22
June,	–	5	–	–	–	6	1	–	1	–	1	–	1	2	–	–	1	2	–	1	–	1	–	1	2	1	26
July,	–	1	–	–	1	–	1	3	4	–	–	–	2	2	2	1	–	–	2	2	1	2	–	–	1	3	28
August,	2	5	4	–	10	3	1	2	1	–	3	2	–	3	1	3	1	–	3	5	3	2	1	6	2	–	63
September,	4	4	1	4	9	1	3	3	–	2	1	1	7	4	1	1	3	1	4	8	3	–	3	2	61	2	133
October,	4	10	7	8	3	1	1	3	–	1	5	4	1	3	3	6	2	1	7	16	5	5	2	7	11	5	121
November,	1	2	2	5	3	2	2	–	–	2	–	3	3	3	2	–	2	3	4	4	1	4	1	3	2	2	56
December,	–	6	–	–	–	3	–	1	–	–	1	2	1	4	–	–	–	1	1	3	3	–	–	1	1	2	30
Totals,	14	42	20	20	27	24	11	17	11	8	11	17	19	27	15	14	12	13	21	43	18	22	10	23	81	19	559

Conclusions.

First, the present method of listing cases chronologically permits them to be entered twice on the list. Second, cases reported "questionable" and not verified are usually listed among the typhoid cases only in case of subsequent death, and in this way the typhoid morbidity is not accurately gauged by the list as posted. Third, the nonverification of reported typhoid cases results in a considerable error in the compilation of health statistics, both as regards morbidity and mortality. Fourth, the nonverification of reported typhoid cases favors a certain amount of malpractice. Much of this is corrected by the hospitals, or by the transference of cases from one physician to another. Fifth, the suffering and death caused by the treatment of appendicitis, poliomyelitis, tuberculosis, pneumonia, etc., as typhoid fever demand a more careful supervision on the part of the public health officials. Sixth, no satisfactory solution or handling of the typhoid fever problem can be accomplished until the individual typhoid cases are speedily and correctly diagnosed.

Study of the True Cases.

The date of the morbidity was found to be difficult to determine accurately in many cases, owing to the insidious onset of the disease. The date when the patient first definitely realized he was sick was usually recorded. This sometimes coincided with the onset of chills, fever, going to bed or calling the doctor.

The morbidity, distributed according to months and wards, is shown by the accompanying charts and tables: —

Morbidity of Cases. — Local Cases.

	Wards.																									Extraneous.	Totals.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25		
Before Jan'y,	–	–	1	–	–	1	–	5	2	1	–	–	2	3	2	1	1	2	–	2	–	–	1	–	–	–	24
January,	1	1	4	–	–	–	1	2	–	–	–	1	1	1	–	1	1	2	–	–	1	–	1	1	–	–	19
February,	1	–	1	–	–	1	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	1	–	–	–	–	5
March,	–	3	–	–	–	–	1	–	–	–	–	–	1	–	–	–	1	1	–	–	–	1	–	–	–	–	8
April,	1	2	–	2	1	–	1	–	1	–	–	1	–	1	1	–	–	–	–	–	–	3	1	–	–	1	16
May,	–	5	–	–	–	4	–	–	–	–	–	–	1	1	1	–	–	1	–	–	–	1	–	3	–	–	17
June,	–	2	–	–	–	3	–	–	3	–	–	–	–	2	–	–	1	1	1	–	–	1	–	–	1	–	15
July.	1	3	–	–	3	1	1	3	2	–	–	1	1	2	1	1	1	–	2	1	1	–	–	2	–	–	27
August,	1	1	4	1	7	2	1	–	1	–	2	1	2	3	1	1	–	–	3	5	1	2	1	3	32	–	75
September,	5	4	3	3	6	1	1	4	–	1	–	2	3	2	–	2	1	2	5	4	2	2	1	5	35	–	94
October,	2	3	6	8	5	1	–	2	–	3	2	4	–	3	2	2	2	1	4	5	1	4	1	–	1	–	62
November,	1	–	–	2	–	1	–	1	–	–	–	1	2	2	–	–	1	3	2	4	2	1	–	3	–	–	26
December,	–	6	–	–	–	1	–	–	–	–	–	1	–	2	–	–	–	–	–	–	2	–	–	–	–	–	12
Totals,	13	30	19	16	22	16	6	17	9	5	4	12	13	22	9	8	9	13	17	21	10	16	6	17	69	1	400

Hospital and Home Treatment.

The number of cases treated at home and in the hospitals is shown in the following tables. Fifty-five per cent. of the cases are hospital cases.

Home Cases.

	Wards.																									Extraneous.	Totals.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25		
January,	–	1	2	–	–	1	–	4	1	1	–	2	–	–	1	2	–	2	–	1	–	–	2	–	–	–	20
February,	1	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1	–	–	5
March,	–	3	1	–	–	2	–	–	–	–	–	–	–	–	1	–	–	1	–	–	–	2	–	–	–	–	10
April,	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	2	1	–	–	–	5
May,	–	2	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–	5
June,	–	1	–	–	–	6	–	–	–	–	1	–	–	–	–	–	1	1	–	1	–	1	–	1	1	–	14
July,	–	–	–	–	–	–	1	–	–	–	–	–	1	1	–	1	–	–	2	1	–	–	–	–	–	–	7
August,	–	1	–	–	–	1	–	–	1	–	2	–	–	–	–	1	–	–	1	3	3	2	1	2	1	–	19
September,	2	2	1	2	4	1	–	1	–	2	–	–	1	–	–	1	2	–	1	6	2	–	3	2	40	–	73
October,	3	3	1	2	1	–	–	2	–	–	3	–	1	1	2	3	2	1	4	12	4	1	1	5	8	–	60
November,	1	1	1	–	–	2	–	–	–	1	–	–	–	–	1	–	–	3	–	4	–	2	1	3	2	–	22
December,	–	–	–	–	–	2	–	–	–	–	1	–	–	2	–	–	–	–	–	2	2	–	–	–	–	–	9
Totals,	7	14	8	4	5	17	–	8	2	4	7	2	3	4	5	8	6	8	8	30	12	10	9	16	52	–	249

Hospital Cases.

	Wards.																									Extraneous.	Totals.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25		
January,	–	–	–	–	–	2	1	1	3	1	–	1	3	4	1	1	2	2	–	2	–	–	–	–	1	1	26
February,	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	2
March,	1	1	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	2	–	–	–	–	6
April,	–	1	–	–	1	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–	–	1	–	–	–	1	6
May,	1	1	–	3	–	1	1	–	1	1	–	2	–	2	1	–	–	–	–	1	–	1	–	–	–	1	17
June,	–	4	–	–	–	–	1	–	1	–	–	–	1	2	–	–	–	1	–	–	–	–	–	–	1	1	12
July,	–	1	–	–	1	–	1	2	4	–	–	–	1	1	2	–	–	–	–	1	1	2	–	–	1	3	21
August,	2	4	4	–	10	2	1	2	–	–	1	2	–	3	1	2	1	–	2	2	–	–	–	4	1	–	44
September,	2	2	–	2	5	–	3	2	–	–	1	1	6	4	1	–	1	1	3	2	1	–	–	–	21	2	60
October,	1	7	6	6	2	1	1	1	–	1	2	4	–	2	1	3	–	–	3	4	1	4	1	2	3	5	61
November,	–	1	1	5	3	–	2	–	–	1	–	3	3	3	1	–	2	–	4	–	1	2	–	–	–	2	34
December,	–	6	–	–	–	1	–	1	–	–	–	2	1	2	–	–	–	1	1	1	1	–	–	1	1	2	21
Totals,	9	28	12	16	22	7	11	9	9	4	4	15	16	23	10	6	6	5	13	13	6	12	1	7	29	19	310

Conclusions.

The North End is the only poor district where a majority of the typhoid cases is treated at home. South Boston, East Boston and Charlestown send most of their cases to the hospitals. This may be partially explained by the Italian dread of hospitals and by the Irish knowledge of these valuable institutions. The advisability of sending all suspected cases to the hospitals is evident for the following reasons: first, the chance of secondary cases in the home is lessened; second, the patient receives

treatment that is either better or less expensive, or both; third, the diagnosis is more often correct, and consequently inappropriate treatment is less likely.

Race.

The grouping of cases according to race is based upon the birthplace of the patient, or, in the case of a child, the birthplace of the parents.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
American,	24	4	8	7	11	10	13	40	93	92	30	16	348
Belgian,	1	–	–	–	–	–	–	–	–	–	–	–	1
Canadian,	1	1	–	2	3	2	1	9	18	6	6	4	53
English,	–	–	–	–	–	–	2	–	–	1	2	–	5
Finnish,	–	–	–	–	–	–	–	–	–	1	–	–	1
French,	–	–	–	–	–	–	–	–	–	–	1	–	1
German,	–	–	–	–	–	1	–	–	1	1	1	–	4
Greek,	–	–	–	–	–	–	–	1	–	–	–	–	1
Hollander,	–	–	–	–	–	1	–	–	–	–	–	–	1
Italian,	6	–	6	1	3	6	5	2	4	6	5	8	52
Irish,	5	1	–	1	1	3	3	3	9	7	8	3	44
Negro,	–	–	–	–	1	1	–	1	1	1	1	–	6
Portuguese,	–	1	–	–	–	–	–	–	–	–	–	–	1
Russian,	2	–	–	–	3	–	2	6	–	–	–	–	13
Scotch,	–	–	–	–	–	–	–	2	1	1	–	–	4
Swedish,	2	–	–	–	–	1	2	–	2	2	1	–	10
Syrian,	2	–	–	–	–	–	–	–	–	–	–	–	2
West Indian,	–	–	–	–	–	–	–	–	–	1	–	–	1
Unknown,	–	–	–	–	–	–	–	–	–	–	–	–	11
Total,													559

Conclusions.

About 35 per cent. of the population of Boston is said to be foreign born, and about an equal percentage of the typhoid fever cases is distributed among these foreign peoples. About 1 per cent. of the fever cases is among the colored people, who form nearly 2 per cent. of the population. The number of cases among the Canadians, 53, or 25 per cent. of the foreign cases, includes many vacationists or emigrants who have come to Boston sick. The Italians, who are said to form about 10 per cent. of the foreign-born population, contribute more than 25 per cent. of the foreign cases. This number is augmented by a number of imported cases, — laborers who have been working outside of the city and have returned to Boston; it also includes, probably, a considerable number of cases not really typhoid fever.

Sex.

The sex of the cases is shown in the following table: —

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
Males, . .	28	4	6	7	14	14	15	46	62	66	34	21	317
Females, . .	18	3	10	4	8	12	13	17	71	55	22	9	242
Totals, .	46	7	16	11	22	26	28	63	133	121	56	30	559

The predominance of males, 317, or 56 per cent., may be due to the greater activity of this sex as travelers. In September, during the milk epidemic in Brighton, when many households were infected, females predominated in number.

Age.

The age periods of the cases is shown in the following five-year division of the cases, compiled by months. The largest number of cases occurred between the ages of fifteen and twenty-five. This is the period stated by Osler to be the time of greatest susceptibility.

Ages.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
Under 5, . .	4	–	1	1	–	5	–	2	8	7	3	4	35
6 to 10, . .	7	1	4	1	1	3	3	9	14	15	5	3	66
11 to 15, . .	4	1	–	2	5	3	4	9	13	13	4	3	61
16 to 20, . .	5	–	2	1	3	2	5	10	18	21	9	1	77
21 to 25, . .	6	–	1	1	4	5	5	15	20	19	8	7	101
26 to 30, . .	6	–	2	–	3	4	4	8	14	17	8	4	70
31 to 35, . .	7	2	1	1	3	–	3	5	15	8	7	1	53
36 to 40, . .	3	3	3	2	1	2	1	1	16	3	6	3	44
41 to 45, . .	4	–	–	1	1	–	2	1	5	4	1	2	21
46 to 50, . .	–	–	1	–	–	–	1	2	5	7	3	1	20
51 to 55, . .	–	–	1	1	–	–	–	1	3	4	1	–	11
56 to 60, . .	–	–	–	–	1	2	–	–	2	2	1	–	8
61 to 65, . .	–	–	–	–	–	–	–	–	–	1	–	1	2
66 to 70, . .	–	–	–	–	–	–	–	–	–	–	–	–	–
Totals, .	46	7	16	11	22	26	28	63	133	121	56	30	559

Occupations.

The occupations of the cases are grouped under two heads, — those that are exposed to infection, and those that are conducive to the spread of infection. Among the occupations especially to be noted for their number are those of traveling salesmen and railroad employees. Of the nurses, 2 were in attendance upon typhoid cases, 1 took care of an appendix case which proved to be typhoid fever, and 2 probably were infected while caring for gall bladder cases. No nurses were reported

sick from the Massachusetts General Hospital, where prophylactic vaccination has been instituted. Some of the occupations, such as domestics, might be grouped under the second class also. The presence of 31 individuals involved in occupations conducive to the spread of typhoid fever probably explains many of the untraced sources of infection of other cases. Among the total number of cases 147 were school children, and 55 were women living at home, without other occupation.

Exposing Occupations.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
Railway employee,	–	–	–	–	1	1	–	1	3	1	3	2	12
Traveling salesman,	3	–	–	–	2	–	–	3	1	–	1	1	11
Domestic,	–	–	1	–	–	1	1	–	4	–	3	1	11
Fisherman,	1	–	–	1	–	3	–	–	1	–	–	–	6
Physician,	1	–	–	–	–	–	1	1	1	1	–	–	5
Nurse,	–	–	–	–	–	–	–	1	–	2	–	2	5
Tailor,	2	–	–	–	–	–	–	1	1	–	–	–	4
Undertaker,	–	–	–	–	–	–	–	–	2	1	–	–	3
Scrubwoman,	1	–	–	–	–	–	–	2	–	–	–	–	3
Actor,	1	–	–	–	–	–	–	–	–	1	–	–	2
Longshoreman,	–	–	–	–	–	–	1	–	1	–	–	–	2
Shoe repairer,	–	–	–	–	–	–	1	1	–	–	–	–	2
Letter carrier,	–	–	–	–	–	–	–	–	–	1	1	–	2
Barber,	–	–	–	–	–	–	–	–	1	–	–	–	1
Disinfector,	–	–	–	–	–	–	–	–	–	1	–	–	1
Plumber,	–	–	–	–	–	–	–	–	–	1	–	–	1
Hospital scrubwoman,	–	–	–	–	–	–	–	–	–	–	1	–	1
Car conductor,	–	–	–	–	–	–	–	–	–	–	1	–	1
Totals,	9	–	1	1	3	5	4	10	15	9	10	6	73

Occupations conducive to the Spread of Typhoid Fever.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
Restaurant helper,	1	–	–	–	–	–	–	–	–	–	–	–	1
Marketman,	1	–	–	–	–	–	–	–	–	–	–	–	1
Baker,	–	–	1	–	–	–	1	–	1	–	1	–	4
Sausage maker,	–	–	–	–	1	–	–	–	–	–	–	–	1
Waitress or waiter,	–	–	–	–	–	1	–	–	1	1	2	1	6
Grocery boy,	–	–	–	–	–	–	–	1	1	–	–	–	2
Laundryman,	–	–	–	–	–	–	–	–	3	–	–	–	3
Iceman,	–	–	–	–	–	–	–	–	1	–	–	–	1
Cook,	–	–	–	–	–	–	–	–	1	–	1	1	3
Cigar maker,	–	–	–	–	–	–	–	–	–	1	–	–	1
Grocer,	–	–	–	–	–	–	–	–	–	1	–	1	2
Masseur,	–	–	–	–	–	–	–	–	–	1	–	–	1
Liquor bottler,	–	–	–	–	–	–	–	1	–	–	–	–	1
Butler,	–	–	–	–	–	–	–	1	–	–	–	–	1
Milkman,	–	–	–	–	–	–	–	1	–	–	–	–	1
Vegetable peddler,	–	–	–	–	–	–	–	1	–	–	–	–	1
Water carrier,	–	–	–	–	–	–	–	–	–	–	–	1	1
Totals,	2	–	1	–	1	1	1	5	8	4	4	4	31

Mortality.

The mortality statistics are incomplete as some of the typhoid cases reported in December may increase the total number. In the following table is shown the mortality by months, and its distribution among the different nationalities: —

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
American,	3	–	–	1	1	3	4	2	11	13	2	1	41
Canadian,	–	–	1	–	–	–	–	2	11	3	–	–	17
English,	–	–	–	–	–	–	2	–	–	–	–	–	2
Irish,	1	1	–	–	–	–	2	–	3	1	3	2	13
Italian,	–	–	1	1	1	–	1	–	–	1	2	1	8
Portuguese,	–	1	–	–	–	–	–	–	–	–	–	–	1
Swedish,	1	–	–	–	–	–	1	–	–	–	–	–	2
Unknown,	–	–	–	–	–	–	–	–	–	–	–	1	1
Totals,	5	2	2	2	2	3	10	4	25	18	7	5	85

The average mortality was 15 per cent. for the year. Among the American born it was 11½ per cent. and among the Canadians 32 per cent. This high mortality rate of the Canadians is perhaps explained by the virulence of infections attributable to Canadian sources, as most of these cases were among travelers from the Provinces. The mortality among the Irish, 29 per cent., is also high, and is possibly referable in part to the low vitality of these people, induced by unhygienic modes of living.

Sanitary Conditions of Homes.

The sanitary conditions under which the cases were living were classified roughly as follows: —

Excellent,	72
Good,	276
Poor,	131
Bad,	42
Questionable,	38
Total,	559

The incidence of the disease, 348 cases, or 62 per cent., among the well-to-do is noteworthy. Under present conditions the people well enough off to be traveling for their vacations or for other reasons are more likely to be infected with typhoid fever than the poorest and most ignorant in the city.

Sources of Infection.

The 559 true cases during the year 1909 can be divided into two main groups: first, those who were not away from Boston during the month preceding their sickness; second, those who returned to Boston having probably become infected elsewhere. Some of these latter cases were sick on their arrival; others became sick shortly after reaching Boston. The distribution of these cases by months and wards is shown in the following tables: —

Local Cases.

	Wards.																									Extraneous.	Totals.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25		
January,	–	1	2	–	–	2	1	4	4	2	–	3	3	4	2	3	2	4	–	3	–	–	2	–	–	–	42
February,	1	–	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1	–	1	7
March,	–	4	1	–	–	1	–	–	–	–	–	–	–	–	2	–	–	1	–	–	–	3	–	–	–	–	12
April,	–	1	–	–	1	1	–	–	–	–	–	–	1	–	1	–	1	–	–	–	–	2	1	–	–	1	10
May,	1	3	–	3	–	2	1	–	1	–	–	1	–	2	1	–	–	–	–	–	–	1	–	2	–	–	18
June,	–	4	–	–	–	6	–	–	1	–	–	–	1	2	–	–	1	2	–	–	–	1	–	1	–	–	19
July,	–	–	–	–	1	–	1	2	4	–	–	–	2	1	1	–	–	–	2	1	1	–	–	–	1	–	17
August,	2	4	4	–	7	2	–	1	1	–	2	2	–	3	1	2	1	–	2	2	2	2	1	4	2	–	47
September,	3	3	1	2	7	1	1	3	–	1	–	1	4	2	–	–	–	1	3	5	1	–	–	–	60	–	99
October,	3	4	4	8	3	–	1	3	–	1	2	2	1	2	1	4	2	1	4	7	2	2	–	4	7	–	68
November,	1	1	2	5	2	2	–	–	–	1	–	2	2	2	1	–	2	3	3	4	1	3	1	2	2	–	42
December,	–	6	–	–	–	1	–	1	–	–	–	2	2	4	–	–	–	1	1	1	4	–	–	1	–	–	24
Totals,	11	31	17	18	21	18	5	14	11	5	4	13	16	22	10	9	9	13	15	23	12	14	5	15	72	2	405

Imported Cases.

	Wards.																									Extraneous.	Totals.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25		
January,	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	4
February,	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
March,	1	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–	4
April,	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	1
May,	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–	1	–	–	–	–	–	1	4
June,	–	1	–	–	–	–	1	–	–	–	1	–	–	–	–	–	–	–	–	1	–	–	–	–	2	1	7
July,	–	1	–	–	–	–	–	1	–	–	–	–	–	1	1	1	–	–	–	1	–	2	–	–	–	3	11
August,	–	1	–	–	3	1	1	1	–	–	1	–	–	–	–	1	–	–	1	3	1	–	–	2	–	–	16
September,	1	2	–	2	2	–	2	1	–	1	1	–	3	2	1	1	3	–	1	3	2	–	3	2	1	2	36
October,	1	6	3	–	–	1	–	–	–	–	3	2	–	1	2	2	–	–	3	9	3	3	2	3	3	5	52
November,	–	1	–	–	1	–	2	–	–	1	–	1	1	1	1	–	–	–	1	–	–	1	–	1	1	2	15
December,	–	–	–	–	–	2	–	–	–	–	1	–	–	–	–	–	–	–	–	2	–	–	–	–	1	2	8
Totals,	3	12	3	2	6	6	6	4	–	3	7	4	4	5	5	5	3	–	6	20	7	8	5	8	9	17	158

Of course it is impossible to trace each case with certainty. The grouping of the cases merely shows the most probable source of infection. In the following tables are shown the probable modes of infection of the local cases: —

Local Cases.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
Known exposure: —													
Secondary,	11	2	3	1	2	3	4	10	6	15	7	8	72
Milk,	–	–	–	–	–	–	–	3	62	7	–	–	72
Milk (?),	–	–	–	–	–	–	–	3	1	4	3	–	11
Unknown exposure: —													
Shellfish (?),	2	–	1	1	1	4	–	1	3	4	10	1	28
Carrier (?),	1	–	–	3	1	1	–	1	2	4	4	1	18
Occupation,	2	1	1	–	1	2	1	4	1	2	–	–	15
Environment,	5	1	1	–	1	1	2	5	3	2	1	–	22
Unknown,	21	3	6	5	12	8	10	20	19	31	16	12	163
Totals,	42	7	12	10	18	19	17	47	97	69	41	22	401

Under the group "secondary" are classified the cases that were known to have been exposed to direct infection in their households or at work. Under "occupation" are grouped nurses, ward tenders, a hospital barber, etc. Under "environment" are grouped several cases of young children playing over dump heaps or dirty swimming waters, gutters, etc. Under "milk" are gathered the cases exposed to infection in Brighton. Under "milk (?)" are cases in Charlestown that were taken sick about the same time as cases in Somerville and Cambridge, supplied by what was thought to be a common infected milk. Under "oysters (?)" are cases unexposed to other known sources of infection who, shortly before being sick, partook of shellfish which may or may not at the time have seemed spoiled. In no instance were two cases clearly traced to the same source of shellfish contamination. Under "carriers" are cases not known to have been otherwise exposed to infection who were living with individuals who have had typhoid fever. In some instances this supposition was supported by a history of several sporadic cases in the household. Among the cases of unknown sources of infection are grouped those concerning whom no history could be obtained, those probably not typhoid, and those probably exposed to undetected avenues of infection. This group could probably be considerably reduced by more thorough and timely investigation.

The subdivisions of the imported cases are shown in the following table: —

Imported Cases.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
Known exposure: —													
Secondary,	–	–	–	–	–	1	1	1	5	2	–	2	12
Milk,	–	–	–	–	–	–	–	–	9	28	–	–	37
Water,	–	–	–	1	–	1	–	–	2	3	1	–	8
Unknown exposure: —													
Oysters (?),	–	–	–	–	–	1	–	1	3	1	2	1	9
Unknown,	4	–	4	–	4	4	10	14	17	18	12	5	92
Totals,	4	–	4	1	4	7	11	16	36	52	15	8	158

Study of these two groups of cases shows that of the 559 cases the source of infection of 264, or 47 per cent., was unknown; 120, or 21 per cent., were probably infected by contaminated milk; 37, or 7 per cent., were possibly infected by the eating of infected shellfish.

Milk Infections.

The milk supplied to Boston is largely furnished by four or five large milk firms. This milk is retailed by these contractors to small firms, and is also distributed widely by the contractors themselves. Much of the milk is mixed at the milk depots, to secure standard and uniform qualities. Unfortunately, this mixing of the milk from many sources greatly favors the dissemination of any infection of the milk that may have taken place. This fact was clearly shown three years ago, in January, 1907, when an explosive epidemic of over seven hundred cases of scarlet fever in four cities followed the infection of the milk of one of these contractors. The dangers of such infection are guarded against by the contractors in two ways. Some of the contractors pasteurize their milk, but this procedure, although it probably lessens the chances of a wide-spread epidemic, does not destroy the toxines generated in infected milk. Moreover, it produces a milk that deteriorates more rapidly when subsequently reinfected with bacteria. All of the firms try to guard against infected milk by careful medical inspection of the farmers and handlers of the milk. But when it is remembered that the milk of Boston is gathered from hundreds of farms in Massachusetts, New Hampshire, Maine, Vermont and New York; and when it is realized that any individual who has ever had, is having or is about to have typhoid fever can infect this milk, and scatter sickness to hundreds of homes, the inhabitant of Boston who has received uninfected milk during the year can thank largely his good fortune. Inspection by milk firms and boards of health can lessen the chances of milk infection, but can

never guarantee its purity while the milk business is conducted as it is to-day.

Reference to the chart showing the morbidity of cases by wards shows a sharp increase in the number of local cases in wards 3, 4 and 5 in October. Of these 14 unexplained cases reported from this district in October, 9, or 64 per cent., obtained their milk from stores. During September and October there occurred outbreaks of typhoid fever in Cambridge and Somerville. After investigating the epidemics in Cambridge, the milk inspector there reported that the September cases for the most part were grouped in North Cambridge, and were thought to be due to a common infected milk supply. The suspected milk was cut off from this region and put into the "run milk" of the contractor which was distributed to other dealers in Cambridge, Charlestown and Boston. The majority of the October cases in Cambridge occurred in East Cambridge, and were attributed to this same infected milk that had been shifted from a North Cambridge to an East Cambridge dealer. This sudden increase of cases in Charlestown among the store-supplied individuals, corresponding in time of morbidity to the increased number of cases in East Cambridge, suggests a common origin for the two sets of cases.

Brighton Epidemic.

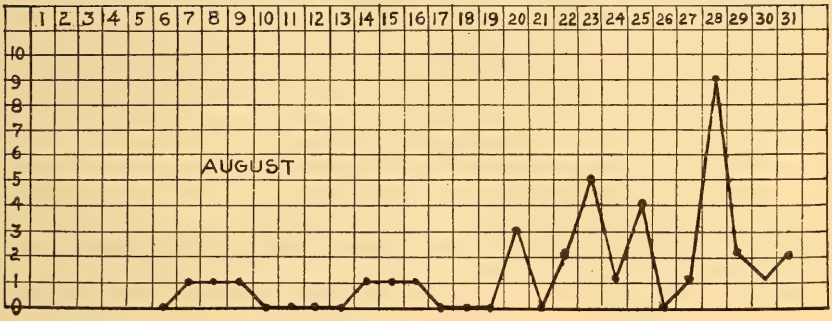
Another more extensive epidemic occurred in September in Brighton. The following data regarding these cases shows conclusively the milk-borne character of the epidemic.

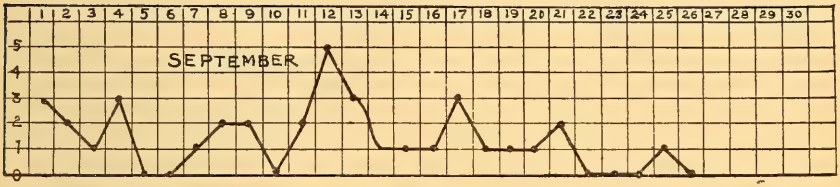
During the first week in September the number of cases of typhoid fever reported for Ward 25, the Brighton district, suddenly increased. The monthly report of the true cases of typhoid fever for this ward for the year is as follows: —

January,	1	September,	61
June,	2	October,	11
July,	1	November,	2
August,	2	December,	1

Investigation of the cause of the number of typhoid cases in this ward showed that, almost without exception, the cases were supplied by a common milkman, or had access to a common milk supply. During August, 2 cases in Ward 25 and 1 case living in Ward 11 but working in Ward 25; during September, 57 cases in Ward 25 and 4 cases in other parts of the city temporarily residents in Ward 25; and during October, 7 cases resident in Ward 25, — a total of 71 cases, — were found to have had milk from a common source. The incidence of morbidity is shown in the following charts.

Incidence of Morbidity in Brighton Epidemic.





The sex of the cases was 32 males, and 39 females.

The age distribution of the cases was as follows: —

Under 5 years,	4	41 to 45 years,	4
6 to 10 years,	5	46 to 50 years,	5
11 to 15 years,	10	51 to 55 years,	1
16 to 20 years,	6	56 to 60 years,	2
21 to 25 years,	11	61 to 65 years,	1
26 to 30 years,	5		—
31 to 35 years,	8	Total,	71
36 to 40 years,	9		

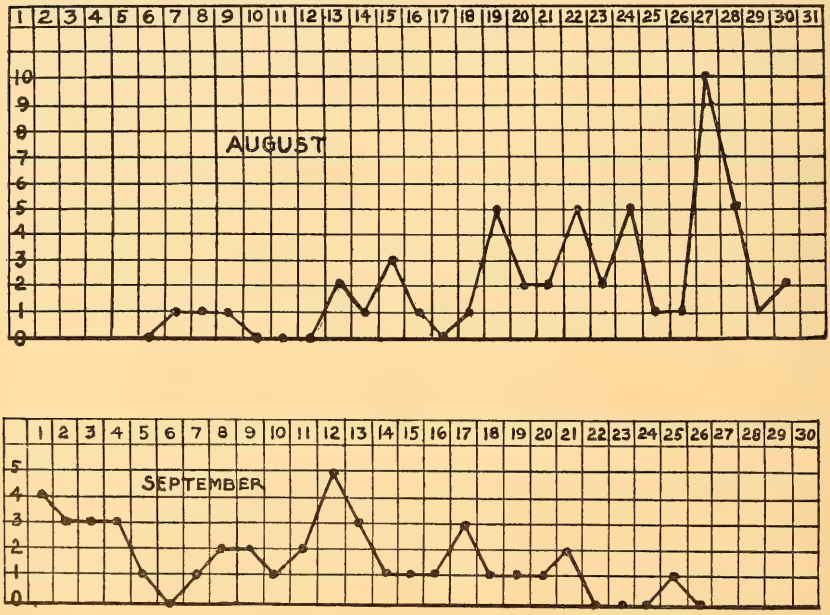
The occupations were as follows: —

Not yet in school,	3	Traveling salesman,	1
School,	20	Iceman,	1
Housewives,	19	Railroad employees,	3
School teacher,	1	Laundrymen,	3
Domestic,	1	Grocerymen,	3
Physician,	1		—
Business men,	13	Total,	71
Teamsters,	2		

Among these cases 8 died, — a mortality of 11 per cent.

The milk suspected was delivered also in Brookline and in Waltham. Here the number of cases of typhoid fever increased sharply in number after this time. Eighteen out of 24 cases examined in Waltham and 5 out of 8 cases in Brookline obtained milk from this infected supply. Thus 94 cases were exposed to infection from this milk. The incidence of morbidity of these cases is shown in the accompanying charts: —

Incidence of Morbidity of Brighton, Brookline and Waltham Cases.



Study of these cases shows that, although they were exposed to infection from a common milk supply, they were probably not all infected therefrom, inasmuch as the period of morbidity is drawn out over a period of more than five weeks. Among these cases are many that may have been due to secondary infection, either from other members of the family or from early cases that may have infected ice, groceries or store milk. Several of the cases had just returned to the city and may have imported their infection.

Sources of the Milk Pollution.

The suspected milk was from two sources. For the most part it came from nine farms in Wayland and Sudbury. Another portion of the milk was obtained at times during August from a Boston milk contractor.

Examination of the suspected milkman's business showed no evident source of infection among his employees or among any of the persons coming in contact with the milk from the time it was received from the farms until it was delivered. The man who capped the milk bottles gave an indefinite history of having had some sort of a fever in his childhood. No typhoid bacilli were found in a single examination of his feces and urine.

The farms producing the milk were examined repeatedly by men from the Boston board of health, and an agent of the State Board of Health made a partial examination. No cases of typhoid fever were found on these farms, and no evident source of contagion was discovered. At one farm two boys were at work who had typhoid fever in 1908, the previous fall. Repeated examinations of urine and feces from these individuals failed to show typhoid bacilli.

Another farm was situated in close proximity to a pond supplied in part by water drained from the Marlborough filter beds. Examination of this water by the Boston board of health showed it to be contaminated with fecal material, and unfit for household use. This water was not used on the farm except as drinking water for the cows while at pasture. That the cows, wading through this water, became contaminated, and that this filth was shaken into the milk pails, seems barely possible. The absence of typhoid fever at the farm itself, however, where milk was freely used, and where the pond was used as a swimming pool, makes this theory very improbable.

The sources of the milk obtained from the Boston contractor were investigated by the Boston board of health without revealing any source of the contagion. Shortly afterwards, however, infected milk said to be from the same milk train, derived from a farm on which there was a case of typhoid fever, was blamed for an outbreak of fever in Cambridge and Somerville. No absolute connection between this infected farm and the Waltham milk dealer has been found, but such a connection may have been the source of the milk contagion.

The possible sources of infection of this milk were: —

1. The sewage-polluted stream near one of the farms.

2. The milk capper, who may have had typhoid fever years ago, and who may now be an intermittent carrier.

3. The boys who had had typhoid fever last year at work on one of the farms.

4. The infected farm supplying milk to the Boston contractor, who furnished milk to the Waltham milk dealer.

Small Local Outbreaks of Typhoid Fever.

Among the local cases in Dorchester were 4 who attributed their infection to a boarding house on Dorchester Avenue, where a waiter was said to have been sick. From these cases there were 2 secondary cases.

In an East Boston Italian family 7 children were infected, one after another. Six of these cases were secondary to a primary case, who probably became infected while working away from home.

Typhoid Houses and Carriers.

In the North and West Ends two houses were found giving a history of repeated cases of typhoid fever. At one house there had been 5 or 6 children sick during the past four years. At the other house 4 children were said to have had typhoid fever during the past year. In both of these houses the hygienic conditions were exceedingly bad. But as none of the cases had gone to a hospital the diagnosis of typhoid fever was not certain. Carriers as a source of these cases were suspected.

In another family, in Dorchester, a boy was taken sick without evident source of infection. Four other members of his family, including his mother, had been sick with typhoid fever in years past.

The comparatively large number of cases in Ward 22 during the first months of the year suggests that the typhoid epidemic in that ward in 1908 is still showing its results through the action of carriers.

Among the imported cases that are numbered with the Boston cases are cases from adjacent cities that were sent to Boston for treatment. Brookline, Somerville, Norwood and Cambridge, where there were small typhoid epidemics, thus contributed to the Boston lists.

In addition to these, there are other cases of travelers from other parts of the country, who seemingly picked up their infection elsewhere, and remained in Boston until convalescent. There is also a large number of Bostonians who returned from various parts of this country or from abroad infected in one way and another. In some instances these cases gave a history of having come from among other typhoid cases. Among such foci of infection may be mentioned Seaview, Rockport, a Maine lumber camp, a dredger in the harbor, etc. Eight cases returned from New Hampshire, 7 from Canada and 6 from Revere, Mass. Single cases of indefinite origin returned from many parts of New England. The

mode of infection in many of these cases was reported to have been from bad water.

The most extensive epidemic outside of Boston that involved Bostonians was at Jefferson, Mass. A report of this milk-borne epidemic has already been published in the September "Monthly Bulletin" of the State Board of Health. But as that report contains various typographical errors, and as some additional data have been collected since the publication of that report, the following summary of some of the facts regarding it is given.

The distribution of the Boston cases was as follows: —

Boston: —	
Brighton,	1
Charlestown,	4
Dorchester,	13
East Boston,	6
Roxbury,	11
South Boston,	2
	37
Other cities,	23
Total,	60

Of these 60 cases, 59 were seen. Of the 59 examined, 46, or 78 per cent., drank the infected milk; 5, or 8 per cent., had cream on cereals or fruit; 8, or 14 per cent., had milk in tea, coffee or cocoa. Fifty-nine, or 100 per cent. of the cases examined, who were thought to have contracted typhoid fever at the Mount Pleasant House, drank the milk or had it on cereals or fruit, or in tea, coffee, or cocoa. Six of the Boston cases, or 16 per cent., died.

General Conclusions.

1. No control of the typhoid fever problem can be hoped for until each individual case of typhoid fever is correctly and promptly diagnosed, and reported with the least possible delay to the board of health.

2. The cases reported as typhoid fever should be verified by blood culture or Widal tests, to insure proper diagnosis and proper resulting treatment of the patient, and to make the health records more accurate, and consequently more effective.

3. A patient suspected of having typhoid fever should be promptly isolated, and treated as a contagious case. Unless adequate care and precautions can be taken at the house, he should be removed to a hospital, both for his own good and for the safety of his family or associates.

4. No patient should be discharged from a hospital or in private practice until he understands clearly the ways in which typhoid fever is spread, and realizes that every case of typhoid fever may remain a source of contagion for an indefinite time without any symptoms of sickness.

5. Whenever possible the feces and urine of a typhoid case should be examined before he is discharged. But a negative result from such an examination should not be taken to prove that the case is not a carrier.

6. A campaign of education of the general public should be instituted, with the object of spreading broadcast the knowledge of the methods by which typhoid fever is transmitted and the ways in which it can be guarded against.

7. The extent of the typhoid morbidity in a community from year to year is at present largely a matter of chance. It should decrease as popular knowledge concerning typhoid fever increases.

8. All persons who are accustomed or forced to travel into other parts of the country, especially to the south and to Canada, or into rural districts, where the chances of getting contaminated water, milk, shellfish or other articles of diet are many, and almost impossible to guard against, and all physicians, nurses, ward tenders and hospital employees, should receive prophylactic inoculation.

RESIGNATION AND APPOINTMENT.

Dr. Frank L. Morse of Somerville was appointed State Inspector of Health on Dec. 8, 1909, in place of Dr. Albert P. Norris of Cambridge, whose resignation took effect on that date.

PROPRIETARY PREPARATIONS ADVERTISED AS UNSALABLE DURING 1909.

White Pine Expectorant with Tar. George A. Miller, 853 Main Street, corner Austin, Cambridge, Mass. (Contains alcohol; not properly labeled.)

Bok's Cold Tablets. Pierson Drug Company, Washington and Essex streets, Boston, Mass. (No statement of the percentage of acetanilid.)

The labels of the following preparations gave no indication as to the presence and amount of alcohol contained therein: —

Professor Penney's Body Regulator. Prepared only by Prof. H. C. Penney, 518 Columbus Avenue, Boston, Mass.

Elixir of Riga. Russian Liquor. M. Strasdowsky.

Dr. Wilson's Wine of Cod Liver Oil with Malt, Wild Cherry and Hypophosphites. The Walker-Rintels Drug Company, 166 Summer Street, opposite South Station, Boston, Mass.

Larkin Root Beer Extract. Larkin Company, pure food chemists. Established 1875. Buffalo, U. S. A.

Rocko-Ryo: Rock and Rye Compound. E. E. Gray Company, distributers, Boston, Mass. Charles L. Richardson & Co., distributers, Boston, Mass.

Horehound, Rock and Rye. Prepared by S. F. Petts & Co., 237 Friend Street, 144 and 148 Canal Street, Boston, Mass.

Hires.[1] (A root beer extract.) Prepared and put up only by The Charles E. Hires Company, Philadelphia, Pa., U. S. A.

Dr. Swett's Root Beer Extract.[1] Prepared by The Dr. George W. Swett Root Beer Company, corner Albany and Harvard streets, Boston.

Indian Root Beer Extract. Prepared by Baker Extract Company. Laboratories, Springfield, Mass., and Portland, Me.

Bryant's Root Beer.[1] (A root beer extract.) The Michigan Drug Company, 26–38 Congress Street, East, Detroit, Mich.

Chionia.[1] Prepared exclusively for physicians' prescriptions. Peacock Chemical Company, St. Louis.

Stearn's Wine [1] (Vinum Olei Morrhuæ, Stearns): Stearn's Wine of Cod Liver Oil with Peptonate of Iron. Frederick Stearns & Co., manufacturing pharmacists, Detroit, U. S. A., Windsor, Ont., Can.

A. & P. Root Beer. Prepared and put up only by the Great Atlantic and Pacific Tea Company, corner West and Vestry streets, New York.

Shaw's Malt.[1] Bernheim Distilling Company, Louisville, Ky.

Joyce's Brand Superior Malt. Chas. H. Joyce, 31 Central Street, and 5 to 15 Middle Street, Lowell, Mass.

Royal Brand Cordial. New York Pure Food Cordial Company, New York, U. S. A., distributers.

PROPRIETARY PREPARATION ADVERTISED AS UNSALABLE IN 1908, FROM WHICH THE PROHIBITION WAS AFTERWARD REMOVED.

Dr. Davis' Anti-Headache or Half-Hour Headache Healer. Dr. N. C. Davis, Indianapolis, Ind.

[1] Prohibition of sale later removed.

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WEEKLY RETURNS OF DEATHS FROM CITIES AND TOWNS OF MORE THAN 10,000 POPULATION.

WEEK ENDING FEB. 5, 1910.

CITIES AND TOWNS.	Population.[1] Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	219	41	71	24	28	4	–	1
Worcester,	136,476	31	5	8	4	3	–	–	–
Fall River,	106,486	33	10	11	3	2	1	–	–
Cambridge,	102,112	39	9	21	11	8	1	–	–
Lowell,	96,380	42	9	11	6	1	–	1	2
New Bedford,	85,516	18	2	8	5	3	–	–	–
Lynn,	84,623	21	4	5	3	2	–	–	–
Springfield,	84,237	32	8	14	7	2	2	1	–
Lawrence,	78,000	25	12	9	3	1	1	–	1
Somerville,	76,049	22	4	5	4	1	–	–	–
Brockton,	55,039	8	2	2	1	1	–	–	–
Holyoke,	53,590	11	5	5	5	–	–	–	–
Malden,	41,941	11	2	6	6	–	–	–	–
Chelsea,	40,080	9	3	2	1	–	–	–	–
Newton,	39,642	8	1	3	1	2	–	–	–
Salem,	39,019	12	–	9	8	1	–	–	–
Haverhill,	38,362	15	5	4	–	2	–	–	–
Fitchburg,	34,263	9	3	3	3	–	–	–	–
Everett,	33,597	5	2	–	–	–	–	–	–
Quincy,	31,937	8	2	3	1	2	–	–	–
Taunton,	30,967	10	1	4	2	1	–	–	–
Waltham,	28,761	7	1	2	2	–	–	–	–
Pittsfield,	27,932	4	3	–	–	–	–	–	–
Brookline,	26,674	5	1	–	–	–	–	–	–
Gloucester,	26,011	2	1	–	–	–	–	–	–
North Adams,	22,150	5	3	1	1	–	–	–	–
Northampton,	21,075	11	2	3	2	1	–	–	–
Chicopee,	21,049	11	5	2	2	–	–	–	–
Medford,	20,921	6	–	3	2	–	–	–	–
Beverly,	16,386	6	1	4	3	1	–	–	–
Leominster,	16,030	4	1	1	1	–	–	–	–
Hyde Park,	15,609	3	1	–	–	–	–	–	–
Melrose,	15,459	4	0	4	3	1	–	–	–
Newburyport,	14,834	2	–	–	–	–	–	–	–
Revere,	14,820	4	1	1	–	–	–	–	–
Westfield,	14,750	4	1	1	1	–	–	–	–
Woburn,	14,522	8	3	1	1	–	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	5	1	2	–	2	–	–	–
Attleborough,	13,913	3	1	1	1	–	–	–	–
Adams,	13,685	1	1	1	1	–	–	–	–
Clinton,	13,105	2	2	1	1	–	–	–	–
Gardner,	13,066	1	0	2	–	1	–	–	–
Milford,	12,722	5	2	1	1	–	–	–	–
Watertown,	12,676	3	0	–	–	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	6	4	–	–	–	–	–	–
Weymouth,	11,798	3	0	–	–	–	–	–	–
Framingham,	11,749	3	–	1	–	1	–	–	–
Wakefield,	11,124	6	–	3	1	–	–	–	–
Webster,	11,109	4	1	–	–	–	–	–	–
Arlington,	10,520	4	–	2	1	1	–	–	–
Greenfield,	10,140	4	–	1	1	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,401,701	724	166	242	123	68	9	2	4

[1] The populations were estimated upon the rate of growth from 1900 to 1905. Those of Taunton, Gloucester, North Adams and Clinton were allowed to stand as in 1905, having shown no increase during the five-year period. The gain in the population of Lowell is due to the annexation of a part of the town of Tewksbury. The population of Lawrence by the census of 1905 was 70,050, but, owing to the building of the new Wood and Arlington mills, an increase of about 8,000 is estimated by the Lawrence Board of Health, or 78,000.

WEEK ENDING FEB. 12, 1910.

CITIES AND TOWNS.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	244	53	81	45	19	4	–	1
Worcester,	136,476	54	10	12	5	3	1	–	–
Fall River,	106,486	28	9	10	5	2	–	–	–
Cambridge,	102,112	27	6	7	3	1	3	–	–
Lowell,	96,380	31	11	13	7	5	–	–	–
New Bedford,	85,516	30	13	8	7	–	–	–	–
Lynn,	84,623	24	5	5	2	2	1	–	–
Springfield,	84,237	27	9	5	1	2	1	–	–
Lawrence,	78,000	41	17	15	4	4	–	–	2
Somerville,	76,049	19	5	10	7	1	–	1	–
Brockton,	55,039	10	2	3	2	–	–	–	–
Holyoke,	53,590	14	2	7	3	4	–	–	–
Malden,	41,941	11	–	6	4	2	–	–	–
Chelsea,	40,080	9	3	4	2	1	–	–	–
Newton,	39,642	14	3	2	2	–	–	–	–
Salem,	39,019	14	3	5	4	–	–	1	–
Haverhill,	38,362	12	5	6	4	1	–	–	–
Fitchburg,	34,263	7	2	–	–	–	–	–	–
Everett,	33,597	9	3	2	–	1	–	–	1
Quincy,	31,937	10	0	1	–	1	–	–	–
Taunton,	30,967	14	1	7	3	3	–	–	–
Waltham,	28,761	5	2	2	–	1	1	–	–
Pittsfield,	27,932	10	–	–	–	–	–	–	–
Brookline,	26,674	6	–	2	2	–	–	–	–
Gloucester,	26,011	10	4	2	–	–	–	–	–
North Adams,	22,150	9	1	4	3	1	–	–	–
Northampton,	21,075	13	2	4	2	2	–	–	–
Chicopee,	21,049	7	1	2	2	–	–	–	–
Medford,	20,921	5	–	4	2	2	–	–	–
Beverly,	16,386	5	–	–	–	–	–	–	–
Leominster,	16,030	5	–	2	2	–	–	–	–
Hyde Park,	15,609	3	–	1	–	1	–	–	–
Melrose,	15,459	6	1	2	2	–	–	–	–
Newburyport,	14,834	5	1	–	–	–	–	–	–
Revere,	14,820	6	2	1	–	–	–	–	–
Westfield,	14,750	3	–	1	–	1	–	–	–
Woburn,	14,522	7	1	3	2	–	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	1	0	–	–	–	–	–	–
Attleborough,	13,913	6	1	2	1	1	–	–	–
Adams,	13,685	1	1	1	–	–	1	–	–
Clinton,	13,105	4	1	2	–	1	1	–	–
Gardner,	13,066	8	3	2	1	–	–	–	–
Milford,	12,722	4	0	2	2	–	–	–	–
Watertown,	12,676	4	1	2	–	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	4	2	3	1	1	–	–	–
Weymouth,	11,798	7	1	–	–	–	–	–	–
Framingham,	11,749	4	–	–	–	–	–	–	–
Wakefield,	11,124	6	–	–	–	–	–	–	–
Webster,	11,109	4	–	–	–	–	–	–	–
Arlington,	10,520	1	–	–	–	–	–	–	–
Greenfield,	10,140	4	–	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,401,701	812	187	253	132	63	13	2	4

Week ending Feb. 19, 1910.

Cities and Towns.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	Deaths from— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	262	74	96	45	21	8	–	5
Worcester,	136,476	40	12	13	6	2	2	1	1
Fall River,	106,486	41	8	13	7	4	–	–	–
Cambridge,	102,112	38	4	19	7	11	–	–	–
Lowell,	96,380	48	16	17	10	1	1	–	4
New Bedford,	85,516	28	13	8	8	–	–	–	–
Lynn,	84,623	32	6	7	5	2	–	–	–
Springfield,	84,237	26	6	12	6	–	–	–	–
Lawrence,	78,000	28	11	13	10	–	2	–	–
Somerville,	76,049	21	7	6	5	–	1	–	–
Brockton,	55,039	23	10	8	3	3	–	–	–
Holyoke,	53,590	18	8	11	8	1	–	–	–
Malden,	41,941	13	3	6	5	–	–	–	–
Chelsea,	40,080	10	2	1	–	1	–	–	–
Newton,	39,642	12	1	5	3	2	–	–	–
Salem,	39,019	14	1	3	1	2	–	–	–
Haverhill,	38,362	13	1	5	4	–	–	–	–
Fitchburg,	34,263	11	4	5	4	1	–	–	–
Everett,	33,597	6	2	1	1	–	–	–	–
Quincy,	31,937	12	4	3	1	1	–	–	1
Taunton,	30,967	20	5	11	6	1	–	–	–
Waltham,	28,761	10	1	3	1	–	–	–	–
Pittsfield,	27,932	8	1	5	2	3	–	–	–
Brookline,	26,674	10	1	2	1	1	–	–	–
Gloucester,	26,011	8	1	1	–	–	–	–	–
North Adams,	22,150	3	1	1	1	–	–	–	–
Northampton,	21,075	7	1	2	1	–	–	–	–
Chicopee,	21,049	9	2	4	1	3	–	–	–
Medford,	20,921	7	1	1	–	1	–	–	–
Beverly,	16,386	5	1	1	1	–	–	–	–
Leominster,	16,030	5	1	1	–	–	–	–	–
Hyde Park,	15,609	2	–	–	–	–	–	–	–
Melrose,	15,459	6	1	1	1	–	–	–	–
Newburyport,	14,834	8	1	5	4	–	–	–	–
Revere,	14,820	4	1	1	1	–	–	–	–
Westfield,	14,750	3	2	1	1	–	–	–	–
Woburn,	14,522	9	2	1	1	–	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	3	0	–	–	–	–	–	–
Attleborough,	13,913	8	1	1	1	–	–	–	–
Adams,	13,685	2	–	1	1	–	–	–	–
Clinton,	13,105	2	1	–	–	–	–	–	–
Gardner,	13,066	5	1	4	3	–	–	–	–
Milford,	12,722	5	0	3	2	1	–	–	–
Watertown,	12,676	1	0	–	–	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	3	2	1	1	–	–	–	–
Weymouth,	11,798	5	0	1	–	1	–	–	–
Framingham,	11,749	0	–	–	–	–	–	–	–
Wakefield,	11,124	1	–	1	–	1	–	–	–
Webster,	11,109	4	–	–	–	–	–	–	–
Arlington,	10,520	4	–	2	–	–	1	–	–
Greenfield,	10,140	2	–	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,401,701	865	221	307	169	64	15	1	11

WEEK ENDING FEB. 26, 1910.

CITIES AND TOWNS.	Population. Estimated for 1909	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	279	71	115	47	32	2	2	2
Worcester,	136,476	29	4	6	6	–	–	–	–
Fall River,	106,486	38	16	18	10	4	1	–	–
Cambridge,	102,112	28	6	9	5	3	–	–	–
Lowell,	96,380	59	23	20	14	3	–	1	1
New Bedford,	85,516	36	21	18	12	4	–	–	–
Lynn,	84,623	16	4	4	2	1	1	–	–
Springfield,	84,237	26	3	9	7	–	–	–	–
Lawrence,	78,000	29	10	13	9	1	–	1	–
Somerville,	76,049	22	3	5	1	1	2	–	–
Brockton,	55,039	17	2	8	5	1	–	–	–
Holyoke,	53,590	26	7	7	7	–	–	–	–
Malden,	41,941	6	1	2	2	–	–	–	–
Chelsea,	40,080	18	3	5	3	1	–	1	–
Newton,	39,642	10	–	1	–	1	–	–	–
Salem,	39,019	12	3	–	–	–	–	–	–
Haverhill,	38,362	11	–	4	2	1	–	–	–
Fitchburg,	34,263	9	3	2	2	–	–	–	–
Everett,	33,597	6	–	2	2	–	–	–	–
Quincy,	31,937	6	2	4	1	2	–	–	1
Taunton,	30,967	15	2	8	5	1	–	–	–
Waltham,	28,761	16	1	3	2	–	–	–	–
Pittsfield,	27,932	3	–	1	1	–	–	–	–
Brookline,	26,674	8	1	1	1	–	–	–	–
Gloucester,	26,011	8	2	1	–	–	–	–	–
North Adams,	22,150	8	3	–	–	–	–	–	–
Northampton,	21,075	10	1	4	2	–	–	–	–
Chicopee,	21,049	6	3	1	–	1	–	–	–
Medford,	20,921	9	–	1	–	1	–	–	–
Beverly,	16,386	4	–	1	–	1	–	–	–
Leominster,	16,030	5	3	2	1	–	–	–	–
Hyde Park,	15,609	5	2	1	1	–	–	–	–
Melrose,	15,459	1	0	–	–	–	–	–	–
Newburyport,	14,834	2	1	1	1	–	–	–	–
Revere,	14,820	2	–	–	–	–	–	–	–
Westfield,	14,750	4	3	–	–	–	–	–	–
Woburn,	14,522	7	1	1	–	1	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	3	0	1	1	–	–	–	–
Attleborough,	13,913	2	1	1	1	–	–	–	–
Adams,	13,685	1	1	1	1	–	–	–	–
Clinton,	13,105	2	1	–	–	–	–	–	–
Gardner,	13,066	4	0	–	–	–	–	–	–
Milford,	12,722	5	1	2	2	–	–	–	–
Watertown,	12,676	2	0	–	–	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	1	1	1	–	–	1	–	–
Weymouth,	11,798	6	3	1	–	–	–	–	–
Framingham,	11,749	2	1	–	–	–	–	–	–
Wakefield,	11,124	0	–	–	–	–	–	–	–
Webster,	11,109	5	–	2	–	2	–	–	–
Arlington,	10,520	2	2	–	–	–	–	–	–
Greenfield,	10,140	4	–	1	–	1	–	–	–

Recapitulation.

Total of reporting towns,	2,401,701	835	216	288	156	63	7	5	4

WEEKLY RETURNS OF DEATHS FROM CERTAIN INFECTIOUS DISEASES.

DEATHS FROM INFECTIOUS DISEASES NOT SPECIFICALLY MENTIONED IN ABOVE TABLES DURING THE WEEKS OF FEB. 5, 12, 19 AND 26, 1910.

DISEASE.	Place.	WEEK ENDING—			
		Feb. 5.	Feb. 12.	Feb. 19.	Feb. 26.
Cerebro-spinal meningitis,	Boston,	1	1	–	4
	Haverhill,	–	–	1	1
	New Bedford,	–	–	–	1
	Waltham,	–	–	–	1
	Worcester,	–	1	–	–
Scarlet fever,	Arlington,	–	–	1	–
	Boston,	4	1	1	3
	Brockton,	–	–	2	–
	Haverhill,	1	–	–	–
	Lawrence,	1	–	–	–
	Lowell,	–	–	–	1
	Malden,	–	–	1	–
	Revere,	1	1	–	–
	Springfield,	–	1	–	–
	Taunton,	1	–	–	–
	Worcester,	–	1	1	–
Whooping cough,	Boston,	–	–	1	1
	Haverhill,	1	1	–	–
	New Bedford,	–	–	–	1
Erysipelas,	Boston,	3	1	3	1
	Brockton,	–	1	–	–
	Gardner,	–	1	–	–
	Medford,	1	–	–	–
	Springfield,	–	–	–	1
	Taunton,	–	–	1	1
	Watertown,	–	1	–	–
	Waltham,	–	–	1	–
	Worcester,	1	–	–	–
Tuberculosis other than pulmonary.	Boston,	2	2	3	6
	Brockton,	–	–	–	1
	Cambridge,	1	–	1	–
	Chelsea,	1	1	–	–
	Fall River,	1	–	–	–
	Gardner,	1	–	1	–
	Gloucester,	–	2	1	1
	Lawrence,	2	1	1	2
	Leominster,	–	–	1	1
	Lowell,	1	1	–	–
	Newburyport,	–	–	1	–
	Somerville,	–	–	–	1
	Southbridge,	–	1	–	–
	Springfield,	1	–	6	–
	Taunton,	–	1	–	–
	Wakefield,	2	–	–	–
	Woburn,	–	1	–	–

DEATHS FROM INFECTIOUS DISEASES, ETC. — *Concluded.*

DISEASE.	Place.	WEEK ENDING—			
		Feb. 5.	Feb. 12.	Feb. 19	Feb. 26.
Influenza,	Boston,	1	1	1	6
	Lowell,	–	–	1	–
	Northampton,	–	–	–	2
	Springfield,	–	–	–	1
	Taunton,	–	–	1	1
	Waltham,	–	–	1	–
	Weymouth,	–	–	–	1

WEEKLY RETURNS OF CASES OF INFECTIOUS DISEASES.

CASES OF INFECTIOUS DISEASES REPORTED DURING THE WEEKS OF FEB. 5, 12, 19 AND 26, 1910.

[Under the provisions of section 52 of chapter 75 of the Revised Laws.]

	WEEK ENDING—				
	Feb. 5.	Feb 12.	Feb. 19.	Feb. 26.	Total.
Diphtheria,	168	214	156	152	690
Measles,	410	601	696	608	2,315
Scarlet fever,	179	182	188	155	704
Typhoid fever,	21	21	27	27	96
Tuberculosis, pulmonary,	151	164	157	146	618
Tuberculosis other than pulmonary,	–	2	3	1	6
Cerebro-spinal meningitis,	3	1	5	4	13
Whooping cough,	17	18	26	12	73
Varicella,	102	87	69	79	337
Erysipelas,	2	–	–	–	2
Mumps,	6	3	11	2	22
Ophthalmia neonatorum,	4	1	2	4	11
Smallpox,	12	8	7	–	27
Anterior poliomyelitis,	–	–	1	1	2
Anthrax,	1	–	–	–	1

MONTHLY REPORT ON INSPECTION OF FOOD AND DRUGS.

The following summary presents the results of the examination of food and drugs made by the State Board of Health during the month of February, 1910: —

Articles examined.	Number found to be of Good Quality.	Number adulterated or varying from the Legal Standard.	Total.	Articles examined.	Number found to be of Good Quality.	Number adulterated or varying from the Legal Standard.	Total.
Baking powder,	1	–	1	Jams and jellies,	7	–	7
Butter,	8	2	10	Lard,	14	10	24
Canned fish,	3	–	3	Lime juice,	1	–	1
Canned fruit and vegetables,	3	–	3	Malt liquor (ale),	1	–	1
Cheese,	3	–	3	Maple sugar,	6	24	30
Cider,	2	–	2	Maple syrup,	1	–	1
Clam bouillon,	1	–	1	Meat products,	24	3	27
Cocoa,	1	–	1	Milk,	260	29	289
Coffee,	2	–	2	Molasses,	1	–	1
Coffee extract,	1	–	1	Olive oil,	17	13	30
Condensed milk,	3	2	5	Peanut butter,	1	–	1
Corn starch,	1	–	1	Pickles,	6	–	6
Cream,	2	–	2	Proprietary foods,	1	–	1
Cream of tartar,	2	2	4	Spices,	9	–	9
Drugs,	39	13	52	Syrups,	2	1	3
Flavoring extracts,	6	–	6	Table sauce,	5	–	5
Honey,	5		5	Vinegar,	3	1	4
Horse-radish,	3	–	3	Wine,	2	3	5
Hulled corn,	1	–	1	Total,	448	103	551

The sample of drugs found to be adulterated were: alcohol, cocaine, hydrochloride, spirit of anise, and a proprietary medicine. The cities and towns in which samples were collected were: Attleborough, Auburn, Beverly, Boston, Brockton, Cambridge, Chelsea, Danvers Dedham, Everett, Franklin, Hyde Park, Lawrence, Lowell, Lynn, Malden, Marlborough, Newton, Oxford, Quincy, Salem, Springfield, Taunton, Watertown, Waltham, Walpole, Westfield, Woburn and Worcester.

PROSECUTIONS FOR VIOLATIONS OF THE LAW RELATING TO FOOD AND DRUGS.

Twelve convictions were secured during the month of February, 1910, for selling adulterated food and drugs, as follows: —

No.	Name of Defendant	Place.	Character of Article sold.
1	Jennie Milano,	Boston,	Lard (contained cotton seed oil).
2	Thomas Logos,	Salem,	Maple sugar.
3	Peter Stazinopulos,	Salem,	Maple sugar.
4	Adam Robson,	Salem,	Milk (total solids, 12.38).[1]
5	George Poulin,	Waverley,	Milk (total solids, 11.38).[2]
6	S. Slater & Sons, Inc.,	Webster,	Milk.[1]
7	S. Slater & Sons, Inc.,	Webster,	Milk.
8	Guiseppe Tussi,	Boston,	Olive oil (contained cotton seed oil).
9	Guiseppe Zuffante,	Boston,	Olive oil (contained cotton seed oil).
10	Guiseppe Zuffante,	Boston,	Olive oil (contained cotton seed oil).
11	Guiseppe Zuffante,	Boston,	Olive oil (contained cotton seed oil).
12	John W. Patch,	Boston,	Spirit of anise (60 per cent. U. S. P).

[1] Watered. [2] Skimmed.

Fines imposed, $224.

Number of Sample.	Character of Sample.	Name of Manufacturer, Wholesaler or Producer.	Results of Analyses.
3509 R	Cream tartar,	Harvard Baking Powder Company, Lowell Mass.,	No cream of tartar present; consists of calcium acid phosphate, calcium sulphate and corn starch.
11287	Raspberry cordial,	N. M. Mackie Scott & Co., Leith, Scotland,	Contains salicylic acid.
3625 R	Cider vinegar,	The Standard Company, Hartford, Conn.,	Not the product of pure apple cider.
3525 R	Olive oil,	Olio Sopraffino, "Madonna" brand,	Contains cotton-seed oil.
3529 R	Olive oil,	Olio Sopraffino, "Vitali" brand,	Contains cotton-seed oil.
3533 R	Olive oil,	Prodotti di Olii, Olio Sopraffino, "La Favorita" brand,	Contains cotton-seed oil.
3535 R	Olive oil,	Prodotti di Olii, Olio Sopraffino, "O. S." brand,	Contains cotton-seed oil.
q 4438	Olive oil,	Olio D'oliva, compound olive oil and cotton salad oil, Spiroplo brand.	Contains cotton-seed oil, incorrectly labelled.
11403	Olive oil,	Italian Produce, superfine olive oil, F. Bertolli Lucca, Tuscany.	Contains cotton-seed oil.
3691 R	Olive oil,	"Universal" brand pure Italian olive oil, compounded with salad oil, Frank Corred, New York.	Contains cotton-seed oil, incorrectly labelled.
3695 R	Olive oil,	Olio D'oliva Sopraffino, Lucca brand,	Contains cotton-seed oil.
3697 R	Olive oil,	Olio Sopraffino per Esportazione, Albert Branzelli & Co.,	Contains cotton-seed oil.
4204 N	Olive oil,	Olio Finissimo D'oliva vergine, "Ri Ditalia" brand,	Contains cotton-seed oil.
11492	Olive oil,	Olio D'oliva, pure olive oil, Italiano Sopraffino "Lucca Malino" brand.	Contains cotton-seed oil.
11423	Spirit of anise,	Walter J. Keating, Lawrence, Mass.,	15 per cent. U. S. P. strength.
11417	Spirit of anise,	A. B. Kelly, Lawrence, Mass.,	34 per cent. U. S. P. strength.
11487	Spirit of anise,	Hall & Lyon Co., Lowell, Mass.,	44 per cent. U. S. P. strength.
11488	Spirit of anise,	Frank E. McNabb, Lowell, Mass.,	38 per cent. U. S. P. strength.
3653 R	Coke Dandruff Cure and Hair Tonic.	A. R. Bremer Company, New York and Chicago,	Contains 32.81 per cent. wood alcohol.
11245	Milk,	J. E. Sheridan, Hyde Park, Mass.,	Total solids, 11.44 per cent.; fat, 2.80 per cent.; proteids, 3.11 per cent.; skimmed milk.
11471	Milk,	Samuel E. Smith, Springfield, Mass.,	Total solids, 11.34 per cent.; fat, 2.60 per cent.; proteids, 3.33 per cent.; skimmed milk.
11465	Milk,	Byron Towne, Springfield, Mass.,	Total solids, 11.06 per cent.; fat, 2 60 per cent.; proteids, 3.15 per cent.; skimmed milk.
11469	Milk,	Martin Healy, Springfield, Mass.,	Total solids, 10.80 per cent.; fat, 2.40 per cent.; proteids, 3.08 per cent.; skimmed milk.
11470	Milk,	M. Green, Springfield, Mass.,	Total solids, 11.83 per cent.; fat, 2.60 per cent.; proteids, 3 44 per cent.; skimmed milk.

INSPECTION OF DAIRIES.

During the month of February, 1910, 128 dairies were examined in the following places: —

Place.	Number examined.	Number found to present no Objectionable Features.	Per Cent.	Number concerning which Letters were sent.	Per Cent.
Braintree,	3	1	33.33	2	66.67
Second inspection,	14	8	57.14	6	42.86
Bridgewater,	–	–	–	–	–
Second inspection,	13	9	69.23	4	30.77
Dracut,	–	–	–	–	–
Third inspection,	2	1	50 00	1	50.00
Holbrook,	–	–	–	–	–
Second inspection,	10	8	80 00	2	20.00
Newton,	11	9	81 82	2	18 18
Second inspection,	43	30	69.77	13	30.23
Sherborn,	2	1	50.00	1	50.00
Third inspection,	1	1	100.00	–	–
West Bridgewater,	1	1	100.00	–	–
Second inspection,	28	23	82.14	5	17.86

Total number of dairies examined,	128
Number found to be free from objectionable conditions,	92
Number concerning which letters were sent,	36
Total number of conditions to which attention was called,	101
Percentage of dairies which passed inspection,	71.88

In addition to the above, 51 dairies were visited at which the sale of milk had been discontinued.

The names of the owners of the dairies found to be worthy of commendation follow: —

Braintree.

Foster, J. M.*
Hayden, F. L.*†
Hunt Bros.*†
King, John
Morrow, A. L.*†
Sanford, Andrew H.*
Sanford, F. H.*†
Sullivan, M. L.*
Thayer, Elmer F.*†

Bridgewater.

Ames, Fisher*†
Burrill, Charles*†
Copeland, George E.*
Copeland, William*
Johnson, George L.*†
Leach, Ernest*†
Murray, James*†
Oliver, James*
Rhoades, E. S.*†

Dracut.

Coburn, Henry G.‡

Holbrook.

Belcher, L. F.*†
Brooks, Frank*†
French, Z. Aaron*†
Holbrook, Elmer*†
Newcomb, R.*†
Poole, C. A.*†
Sands, William*†
West, William*†

* Second inspection. † Reported favorably on first inspection. ‡ Third inspection.

Newton.

Bacon Farm*†
Barry, M. Jr.*†
Casey, James D.*†
Cook, Samuel H.*
Cunningham, Mrs. Mary*†
Dawney, James*
Dennison, Mrs. Henriette*†
Devoy, James*
Dignen, Frank E.
Edmands, A. Lawrence*†
Ellis, George H.*†
Ellis, James F.*
Fife, Dora
Frye, Theophilus*†
Guthrie, Thomas*
Hannon, Mary F.*†
Hawkes, George W.*†
Hickey, Michael J.*†
Hurley, Frank*†
Janse, John*
Jones, James
Kincare, John E.*†
King, Lyman W.*
Leonard, Patrick
Maloney, M.
Marcy, G. L.*
McAdoo, Robert J.*†
McMahon, Patrick*
Noonan, David F.
O'Brien, John*†
Paul, Estate of L.*
Staples, George P.*†
Stearns, Charles C.
Stephens, Albert*
Twomey, M. J.
Wales, W. H.*
Watt, Joseph B.*
Welles, W. W.
Wiswall, William E.*

Sherborn.

Dodge, M. C.
Hodge, W. H. Jr.‡

West Bridgewater.

Alger, G. W.
Anderson Bros.*
Anderson, Charles*†
Bartlett, Horace*†
Bennett, Rufus*†
Bergeron, D. J.*†
Copeland Bros.*†
Davenport, H. O.*
Ekland, L.*†
Hayward, Estate of J. L.*
Howard, Clinton B.*†
Howard, Frank L.*†
Manley, Albert*†
Millis, A.*†
Petersen, G. A.*
Ryder, W. F.*†
Sands, J. S.*†
Sullivan, James*†
Thayer, Estate of Erland*
Thompson, C. H.*†
West Bridgewater Town Farm*
Winberg, A.*
Wood, Frank*†
Woodworth, W. L.*†

ANTI-TYPHOID INOCULATION CONDUCTED AT THE MASSACHUSETTS GENERAL HOSPITAL.[1]

By Lesley H. Spooner, M.D., Boston.

[Note. — This work was suggested by Dr. Mark W. Richardson, secretary of the State Board of Health. The financial support was provided by Dr. Richardson, Mr. Frederick W. Lord of New York and Mrs. Robert S. Bradley of Boston.]

Stimulated by the results of the Royal Army Medical Corps, which has produced so successfully in British soldiers artificial immunity against typhoid fever, I have carried on at the Massachusetts General Hospital during the past year several series of voluntary typhoid inoculations. In the preparation of my inoculation material or vaccines I have profited by the researches and the results of the British Commission,[2] whose work upon the subject is the most complete at the present time.

* Second inspection. † Reported favorably on first inspection. ‡ Third inspection.

[1] Reprinted from the "Boston Medical and Surgical Journal" for Jan. 13, 1910.

[2] Leishman and Harrison: Jour. Roy. Army Med. Corps, 1907, viii, pp. 462 and 472; also x, p. 583; also xi, p. 327.

The typhoid bacilli grown for twenty-four hours on agar slants are washed into a sterile tube, thoroughly shaken and counted by the Zeiss blood platelet counter. They are then exposed in the water bath to the temperature of 53° C. for one hour, diluted with the necessary amount of salt solution in a small bottle, and sealed with a rubber nipple. Lysol 0.25 per cent. is then added, to prevent contamination. The vaccines of any strength may be prepared, but the most convenient is that in which 1 ccm. contains 400,000,000 bacilli. They should be kept in the dark, away from dust, at room temperature. Vaccines more than one month old have not been used, although it is probable that they retain their strength much longer. The question of dosage is one over which there has been so much controversy that it seemed best to begin with small doses, repeated at short intervals. In this way it was hoped to avoid severe reaction and general intoxication which sometimes follow doses of 500 and 1,000 M., as used by the Royal Army Medical Corps. In order to determine the effect of small doses, I first inoculated 5 house officers of the Massachusetts Hospital with 50 M. typhoid bacilli, which inoculation was followed by another of 100 M. on the third, fourth or fifth day.

In determining the end results of typhoid inoculation, it is obviously impossible to rely upon the diminished occurrence of typhoid fever among the inoculated, because under the ordinary conditions the morbidity is small. One turns naturally at once to a determination of the anti-tropic or immune substances in the blood, and in this work the agglutination test has been selected, as the one most satisfactorily employed.

The technic is as follows: Bouillon cultures of the typhoid bacillus are grown at room temperature for twenty-four hours. Drops of this bouillon are placed on slides and mixed with serum, derived from centrifugalized blood, in the following proportions, viz., 1:5, 1:10, 1:25, 1:50, 1:100, 1:500, 1:1,000 and 1:5,000. These preparations are kept at room temperature, and are observed under the high-power dry lens after one hour. In the positive cases it is rare to find every bacillus clumped, but it is equally unusual to see many free bacilli in the low dilutions. In all cases the end point is taken to be that in which there are many free bacilli and in which there is some motility, no matter how sluggish. This dilution, which is sharply contrasted with its neighbor, is considered negative and the next stronger taken as positive.

Inoculations were performed with glass "Tuberculin sub-cu." syringes, which were boiled between injections. The commonly selected site for inoculation was at the insertion of the deltoid on the left arm. Alcohol was used as a local antiseptic.

Preliminary agglutination tests were made on all the five house officers

above mentioned and were found to be negative, even in the 1:5 dilution, in three, but positive at that ratio in the other two. This fact was explained by further questioning, which showed that one subject when seven years old had suffered from what had been called "slow fever," and the other had received a single typhoid inoculation at another hospital a year before.

All five received 50 M. of the stock vaccine, which dose was followed on the third day in two cases, the fourth in one and the fifth in the other two by a second dose of 100 M. Widal reactions were tried on various days. They showed that the agglutinating power did not begin to ascend until from the sixth to the ninth day, when a sudden rise took place. This level or even a higher one was maintained for from one to two weeks. Then occurred a slight fall, but the cases continued to show a marked elevation above the normal, which lasted three months after inoculation.

The detailed results are as follows: —

	Widal prior to Inoculation.	One Week after Inoculation.	Two Weeks.	Three Weeks.	One Month.	Three Months.
W. W. D. (Case 1), . .	1:5	1:50	1:50	1:50	1:50	1:50
J. G. (Case 2), . . .	1:5	1:100	1:50	1:50	1:50	1:50
R. L. T. (Case 3), . . .	0	1:100	1:100	1:100	–	1:25
C. H. L. (Case 4), . . .	0	1:100	1:1000	1:500	–	1:100
C. A. H. (Case 5), . . .	0	1:50	1:100	1:100	1:100	1:50

Cases 1 and 2 were those cited as having been somewhat protected previously, the one by a mild attack of the disease twenty years before, and the other by one vaccine inoculation. Their reaction is of importance and interest, in view of the present theory of active immunity. Although it is not evident in the table, both men showed a quicker and sharper response to the inoculation, and in both cases the secondary descent of the Widal curve came earlier. The first observation is thoroughly in accord with the assumption that in the immunized the antibodies are present in the tissues, and are merely awaiting a stimulus to bring them forth. It is not possible to explain why the agglutinins, once established, should diminish sooner than in the other cases.

The effect of larger doses remained still to be proved. This point I settled myself by receiving in three successive weeks doses of 100, 200 and 300 M., without appreciable constitutional reaction.

The results were so encouraging that it was decided to place the matter before the authorities of the Massachusetts General Hospital, and call

for volunteers among the nurses and ward tenders, in an effort to stamp out typhoid fever as contracted within the hospital by these employees.

In the early part of July the nurses were given a talk by Dr. Richardson and myself upon the prevalence of the disease and its incidence in the hospital,[1] and upon measures which might be taken to prevent it. As a result, a large percentage of those present volunteered to receive inoculation.

A brief history was taken in every instance, to ascertain recent and remote exposure to the disease, and whether the nurse had ever suffered from typhoid. All who had even a suspicious record of fever were rejected. The temperature on the day of inoculation was also taken to make certain the perfect health of the individual.

At this time 53 nurses received an initial dose of 50 M., followed at intervals of five days by 100 and 200 M. In all cases local soreness and induration appeared in a few hours. Pain on moving the arm was noted by some, and in three cases, to be mentioned later, small glands were palpable in the axilla. Constitutional symptoms were uncommon, and when present were rarely marked. They were severe enough to make only two nurses decline further inoculation.

The initial Widal reactions were positive in dilutions of 1:5 in 7 cases and absolutely negative in 46. After two weeks the agglutination tests were repeated, with the following results: —

Dilution of Widal.	Number of Cases.	Percentage of Cases.[2]	Dilution of Widal.	Number of Cases.	Percentage of Cases.[2]
1:5	0	0	1:50	25	49
1:10	4	8	1:100	15	29
1:25	6	12	1:500	1	2

A short talk was then given the ward tenders by the writer, and 9 volunteered for inoculation. For several reasons the treatment was completed in only 6. The agglutination test was absolutely negative in all cases prior to inoculation, and two weeks later showed the following results: —

1:100	1 case.
1:50	4 cases.
1:25	1 case.
1:10	2 cases.[3]
1:5	1 case.[4]

[1] Spooner: Typhoid Fever: Incidence of the Disease as contracted within the Massachusetts General Hospital from 1899 to 1908. Am. Jour. Pub. Hyg., vol. xix, no. 4, August, 1909.

[2] Two nurses received fewer than the regular number of inoculations and have been omitted from this table.

[3] Both received only two inoculations.

[4] One inoculation only.

The percentages are nearly identical with those stated above, but as a series they are of little value except to emphasize the necessity of repeated inoculation. If one can estimate the comparative importance of the separate inoculations, the second seems to be the most valuable; the first alone is apparently worthless. Although two are far more powerful than one, the third inoculation seems to aid greatly to the immunizing strength.

These and the following cases received doses of 100, 200 and 300 M. at intervals of five days. Two of the ward tenders complained of constitutional reaction, *i.e.,* diarrhœa and feverishness, the etiology of which, during the summer, is hard to determine. As a whole, the reaction was no more severe than with the smaller doses.

A sudden influx of typhoid cases at the Chelsea Naval Hospital induced the officers in charge of that institution to have inoculation performed upon the nurses. Accordingly, 4 officers and 10 men were vaccinated. None were accepted who had had typhoid or who were running a temperature. Three of the number showed a positive agglutination in a dilution of 1:5. Eleven were absolutely negative. The results after three weeks were: —

1:100	4 cases.
1:50	7 cases.
1:25	3 cases.

In the early part of September, 23 more Massachusetts Hospital nurses, chiefly in the entering class, were inoculated with the larger dose, *i.e.,* 100, 200 and 300 M. The reaction was no greater locally than before, but two had headache and nausea during the night following inoculation, which disappeared the next day. Two nurses showed a positive Widal reaction of 1:5, and 21 were completely negative. At the expiration of two weeks the results were as follows: —

1:100	4 cases.
1:50	14 cases.
1:25	4 cases.
1:10	1 case.

The results of similar inoculations upon 4 more house officers complete the work. From absolutely negative Widals they showed, two weeks after inoculation, positive reactions in dilutions of 1:100 in one case and 1:50 in the others. The former, that of the writer, has persisted in that strength for two months.

As a matter of comparison, 4 convalescent typhoid patients, two weeks after normal temperature had been reached, were studied. Their agglutination reactions performed in the same way were positive in dilutions of 1:500 in one case, 1:100 in another and 1:50 in the other two.

Before making a plea for regular hospital inoculation, it was decided to question the nurses as to the exact extent of inconvenience from this method of immunization. Fifty nurses were consulted, and reported their feelings in detail. In 46 the local reaction was only "slight." In these there was very slight difficulty in moving the arm. The local reaction was more severe in the remaining 4, being characterized by all as "considerable." Motion of the arm was more painful and in some almost difficult. All these symptoms lasted less than twenty-four hours. In three cases tender axillary glands were palpable on the day of inoculation, which disappeared by the following morning. Twenty-nine nurses suffered from no general reaction. In 18 it was trifling, consisting of slight headache and mild malaise, which was felt the afternoon and night following inoculation, disappearing on the next day. Three nurses experienced severe headache and nausea during the reaction period. One of the latter, the only case in the training school, was absent from duty for a half day.

Finally, all the nurses affirmed without exception that they would have undergone the inoculation, even if they had known the severity of the reaction and the general inconvenience, provided that it carried with it the hope of immunity, as suggested in the present instance. This is a matter of utmost importance, since by means of such statistics the medical profession should be urged to acquaint the public of the ease with which immunity can probably be acquired.

The severity of the reaction does not bear a direct relation, however, to the degree of immunity conveyed. The greater number of those showing the higher agglutinating power suffered only slight local and no constitutional reaction. On the other hand, several with smaller amounts of agglutinins complained of more violent general disturbance. The following table indicates this relation: —

Local Reaction.

	1:10.	1:25.	1:50.	1:100.	1:500.	Total.
Slight,	4	7	20	14	1	46
Considerable,	1	–	3	–	–	4
						50
Palpable glands,	–	–	2	1	–	3

General Reaction.

Absent,	1	6	11	10	1	29
Slight,	3	1	9	5	–	18
Considerable,	1	–	2	–	–	3
						50

To summarize,[1] 103 people have been inoculated. Of these, 74 were Massachusetts Hospital nurses, 9 house officers and 6 ward tenders. Fourteen were vaccinated at the Naval Hospital. Of this number, 6, or 5.8 per cent., reacted in dilutions of 1:10; 14, or 13.6 per cent., 1:25; 56, or 54.4 per cent., 1:50; 26, or 25.2 per cent., 1:100; and 1, or 1 per cent., 1:500. In other words, 94.2 per cent. of those inoculated showed agglutination tests in dilutions of 1:25 or more; and 80.6 per cent. in 1:50 or more.

Since inoculations have been started there have been no cases of typhoid fever contracted at the Massachusetts Hospital among the nurses, house officers or ward tenders, or in those inoculated at the Chelsea Naval Hospital.

The results of this work are striking, inasmuch as high agglutinating power has been produced with small doses of vaccine and with slight constitutional reaction. Furthermore, although it may be doubted whether agglutinating power is necessarily synonymous with immunity, yet it is hard to believe that agglutinins can exist in the blood to such an extent without a considerable degree of immunity.

It is, therefore, impossible at the present time to say definitely how strong the immunity acquired through inoculation is, or how long it will last. There would seem to be no doubt, however, in the first place, that nurses, ward tenders, physicians and others who are brought into intimate relation with typhoid patients should submit to inoculation; secondly, that those who plan to make a journey into districts known to be subject to typhoid fever should be inoculated; and, thirdly, inoculation is likely to become advisable and more or less general in districts where typhoid is epidemic. This would seem to be especially appropriate for other members of a family in which typhoid is present. Finally, a necessity for inoculation against typhoid will probably be always with us. About 4 per cent. of all typhoid patients become what are known as chronic carriers of the disease; that is to say, they may harbor in the urine or stools the typhoid bacillus for a long term of years. No matter, therefore, how careful we may be as to the supervision of our milk and water supplies, there will always be the danger of typhoid epidemics arising from infection of the milk or the water through the typhoid carrier. It is possible, of course, that methods may be devised for the cure of this persistance of the typhoid organism in certain individuals, but the outlook for the elimination of the typhoid carrier cannot be said at present to be hopeful.

Note. — I am indebted for hearty co-operation in this work to Dr. Frederic A. Washburn of the Massachusetts General Hospital, to Miss Pauline

[1] In this summary eight cases have been omitted because they have received fewer than the required number of inoculations.

L. Dolliver and Miss Georgianna J. Sanders of the Massachusetts Hospital Training School for Nurses, and to the officer in charge of the United States Naval Hospital at Chelsea. I wish to take this means of thanking also those house officers, nurses and ward tenders of the Massachusetts Hospital and of the Naval Hospital for their aid in furthering an investigation which should be of some advantage to mankind.

SPECIFIC INOCULATION AGAINST TYPHOID FEVER.[1]

We print elsewhere in this week's issue an article by Dr. Lesley H. Spooner, in which is given further details concerning the inoculation of nurses, house officers and other attendants upon the sick at the Massachusetts General Hospital against typhoid infection.

In previous papers[2] Dr. Spooner and Dr. M. W. Richardson, secretary of the State Board of Health, gave accounts of an investigation as to the occurrence of typhoid fever at the Massachusetts General Hospital among the nurses and ward tenders for the ten years previous to 1909, and it appeared that from two to six of such hospital attendants contracted the disease within the hospital every year. This hospital typhoid fever was manifestly much to be regretted, and it seemed distinctly advisable that every effort be made to eradicate it. In view of the fact that typhoid inoculation had been practised in England and Germany with what seemed to be very encouraging results, the matter was laid before the hospital authorities and the nurses themselves last summer, with the result that a large proportion of the nurses and ward tenders submitted to inoculation with small numbers of dead typhoid germs.

The typhoid season is now practically over, and as yet there have been no cases of typhoid among the hospital attendants this year. That this much-desired result cannot be attributed exclusively to inoculation is apparent from the fact that there has been no typhoid among those who were not inoculated. It is more than possible that the nurses have been unusually careful, from the fact that the danger of infection has been emphasized this year more than usual. Then, too, a newly instituted requirement that nurses when handling typhoid stools and urines shall wear rubber gloves very probably has played an important part in the prevention of infection. The institution of anti-typhoid inoculation, however, at the Massachusetts General Hospital, shows that this practice is gaining ground distinctly as a preventive procedure, and it seems more than probable that its use will become more and more common during the next few years.

[1] Editorial, "Boston Medical and Surgical Journal" for Jan. 13, 1910.
[2] Am. Jour. Pub. Hyg., August, 1909.

It should become popular immediately with physicians, nurses, ward tenders, — in fact, with all persons who have anything to do directly or indirectly with typhoid patients. It should appeal to other members of any family in which the disease breaks out. It should appeal to communities in which for any reason typhoid fever becomes epidemic, and it should be practised upon all individuals who intend to sojourn for a shorter or longer period in regions known to be infected with typhoid fever. For instance, as a straw showing which way the wind is blowing, a Boston physician having business in Montreal, in which city typhoid is now epidemic, voluntarily sought inoculation recently, wth the idea of protecting himself against possible infection in the above-mentioned city.

We are, of course, at present in the dark as to how long the protection afforded by typhoid inoculation lasts, but the procedure is so simple and causes so little discomfort that its practice should become common in the immediate future. For, in spite of the great increase in our knowledge concerning typhoid fever, we are far from being in a satisfactory position from the point of view of the general public safety. Much has been accomplished by safeguarding the purity of public water supplies, but a citizen of Boston, for example, is still in danger through milk infection from localities at great distances from the metropolis. For instance, typhoid fever in a New Hampshire dairy caused, in 1909, an outbreak of the disease in Somerville and Cambridge. Beginning typhoid in a waitress at Jefferson spread, through milk contamination, 58 cases of typhoid among neighboring cities. A farmer in Maynard, who had the disease in 1905, has carried the bacilli in his urine ever since, and every year has been the source of typhoid fever in his milk route. Inasmuch, therefore, as one can never tell when he will next be exposed to typhoid infection, protection through specific inoculation should be acquired. It does not, apparently, entail anywhere near the amount of pain and discomfort endured by us willingly in our efforts to preserve our teeth, and the results striven for are certainly of equal importance.

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The above preparation, as now presented to the trade, bears a label which meets the requirements of this Board, and may be sold at retail.

MONTHLY BULLETIN

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Law relative to common drinking cup,	95

WEEKLY RETURNS OF DEATHS FROM CITIES AND TOWNS OF MORE THAN 10,000 POPULATION.

WEEK ENDING MARCH 5, 1910.

CITIES AND TOWNS.	Population [1] Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM — Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	215	54	89	39	29	4	1	2
Worcester,	136,476	42	9	15	11	3	–	–	–
Fall River,	106,486	42	16	20	7	5	–	–	–
Cambridge,	102,112	29	6	8	5	2	–	–	–
Lowell,	96,380	52	20	20	14	3	–	–	2
New Bedford,	85,516	32	14	12	10	1	–	–	–
Lynn,	84,623	16	0	6	3	1	–	2	–
Springfield,	84,237	25	9	10	5	–	–	–	1
Lawrence,	78,000	30	15	11	9	–	–	1	–
Somerville,	76,049	26	5	9	4	2	–	–	–
Brockton,	55,039	14	2	6	2	3	–	–	–
Holyoke,	53,590	17	7	4	2	2	–	–	–
Malden,	41,941	15	4	7	2	1	1	–	–
Chelsea,	40,080	10	3	4	4	–	–	–	–
Newton,	39,642	8	1	–	–	–	–	–	–
Salem,	39,019	16	–	8	3	5	–	–	–
Haverhill,	38,362	26	1	16	13	1	–	1	–
Fitchburg,	34,263	8	4	3	3	–	–	–	–
Everett,	33,597	13	1	3	–	2	–	–	–
Quincy,	31,937	7	2	2	2	–	–	–	–
Taunton,	30,967	12	2	3	3	–	–	–	–
Waltham,	28,761	12	1	3	1	1	–	1	–
Pittsfield,	27,932	5	2	2	1	1	–	–	–
Brookline,	26,674	5	–	–	–	–	–	–	–
Gloucester,	26,011	12	1	7	6	1	–	–	–
North Adams,	22,150	1	–	–	–	–	–	–	–
Northampton,	21,075	8	2	2	1	–	–	–	–
Chicopee,	21,049	6	2	1	1	–	–	–	–
Medford,	20,921	2	–	–	–	–	–	–	–
Beverly,	16,386	4	1	–	–	–	–	–	–
Leominster,	16,030	7	–	2	–	2	–	–	–
Hyde Park,	15,609	9	3	3	2	–	–	–	–
Melrose,	15,459	2	0	1	1	–	–	–	–
Newburyport,	14,834	3	1	–	–	–	–	–	–
Revere,	14,820	5	–	3	–	2	–	1	–
Westfield,	14,750	3	–	1	–	1	–	–	–
Woburn,	14,522	3	0	–	–	–	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	5	0	–	–	–	–	–	–
Attleborough,	13,913	7	1	4	4	–	–	–	–
Adams,	13,685	2	1	–	–	–	–	–	–
Clinton,	13,105	2	1	–	–	–	–	–	–
Gardner,	13,066	4	2	2	2	–	–	–	–
Milford,	12,722	3	0	2	2	–	–	–	–
Watertown,	12,676	2	1	–	–	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	1	–	–	–	–	–	–	–
Weymouth,	11,798	4	0	–	–	–	–	–	–
Framingham,	11,749	4	1	1	1	–	–	–	–
Wakefield,	11,124	3	–	1	–	–	–	–	–
Webster,	11,109	2	–	–	–	–	–	–	–
Arlington,	10,520	2	–	–	–	–	–	–	–
Greenfield,	10,140	2	1	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,401,701	785	196	291	163	68	5	7	5

[1] The populations were estimated upon the rate of growth from 1900 to 1905. Those of Taunton, Gloucester, North Adams and Clinton were allowed to stand as in 1905, having shown no increase during the five-year period. The gain in the population of Lowell is due to the annexation of a part of the town of Tewksbury. The population of Lawrence by the census of 1905 was 70,050, but, owing to the building of the new Wood and Arlington mills, an increase of about 8,000 is estimated by the Lawrence Board of Health, or 78,000.

Week ending March 12, 1910.

Cities and Towns.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	Deaths from— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	248	66	92	42	24	4	–	2
Worcester,	136,476	45	12	15	8	1	1	1	–
Fall River,	106,486	33	15	15	9	–	–	–	–
Cambridge,	102,112	29	5	16	7	8	–	–	–
Lowell,	96,380	45	16	14	7	2	2	–	1
New Bedford,	85,516	28	14	14	10	2	–	–	1
Lynn,	84,623	25	6	7	2	2	1	1	–
Springfield,	84,237	26	3	6	2	1	–	–	–
Lawrence,	78,000	28	12	10	3	2	1	1	1
Somerville,	76,049	25	4	15	12	1	–	–	–
Brockton,	55,039	14	1	3	3	–	–	–	–
Holyoke,	53,590	20	12	12	7	–	–	–	–
Malden,	41,941	14	1	4	1	–	–	–	–
Chelsea,	40,080	11	2	2	2	–	–	–	–
Newton,	39,642	11	4	4	3	1	–	–	–
Salem,	39,019	10	3	4	4	–	–	–	–
Haverhill,	38,362	27	4	12	7	2	–	–	–
Fitchburg,	34,263	11	5	7	5	2	–	–	–
Everett,	33,597	11	3	2	–	2	–	–	–
Quincy,	31,937	6	4	1	1	–	–	–	–
Taunton,	30,967	16	4	5	4	–	–	–	–
Waltham,	28,761	5	0	3	2	1	–	–	–
Pittsfield,	27,932	10	4	2	–	2	–	–	–
Brookline,	26,674	7	4	1	1	–	–	–	–
Gloucester,	26,011	8	1	1	–	1	–	–	–
North Adams,	22,150	2	1	–	–	–	–	–	–
Northampton,	21,075	6	–	1	–	–	–	–	–
Chicopee,	21,049	9	3	1	1	–	–	–	–
Medford,	20,921	3	0	–	–	–	–	–	–
Beverly,	16,386	9	1	–	–	–	–	–	–
Leominster,	16,030	4	1	1	–	1	–	–	–
Hyde Park,	15,609	5	3	2	1	–	1	–	–
Melrose,	15,459	1	1	1	1	–	–	–	–
Newburyport,	14,834	5	–	1	–	–	–	–	–
Revere,	14,820	2	–	–	–	–	–	–	–
Westfield,	14,750	3	–	2	1	–	1	–	–
Woburn,	14,522	1	0	–	–	–	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	3	0	1	–	1	–	–	–
Attleborough,	13,913	3	0	1	1	–	–	–	–
Adams,	13,685	1	1	–	–	–	–	–	–
Clinton,	13,105	3	–	3	3	–	–	–	–
Gardner,	13,066	2	0	–	–	–	–	–	–
Milford,	12,722	10	4	6	6	–	–	–	–
Watertown,	12,676	2	0	2	–	2	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	2	1	1	–	–	–	–	–
Weymouth,	11,798	5	2	1	–	1	–	–	–
Framingham,	11,749	4	–	2	1	1	–	–	–
Wakefield,	11,124	2	–	–	–	–	–	–	–
Webster,	11,109	3	–	–	–	–	–	–	–
Arlington,	10,520	4	–	–	–	–	–	–	–
Greenfield,	10,140	3	0	1	–	1	–	–	–
Recapitulation.									
Total of reporting towns,	2,401,701	810	223	294	157	61	11	3	5

WEEK ENDING MARCH 19, 1910.

CITIES AND TOWNS.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	241	55	83	34	25	3	–	4
Worcester,	136,476	56	10	19	13	1	1	–	–
Fall River,	106,486	41	19	20	13	3	–	–	1
Cambridge,	102,112	41	10	16	8	5	–	–	–
Lowell,	96,380	42	19	16	10	3	–	1	1
New Bedford,	85,516	38	13	11	9	1	–	–	–
Lynn,	84,623	22	7	9	3	3	1	1	–
Springfield,	84,237	41	12	14	4	2	–	1	1
Lawrence,	78,000	28	13	15	5	2	1	1	1
Somerville,	76,049	24	4	8	6	1	–	–	–
Brockton,	55,039	20	5	10	7	2	–	–	–
Holyoke,	53,590	22	10	8	3	2	–	–	–
Malden,	41,941	16	3	4	1	2	–	1	–
Chelsea,	40,080	13	5	4	3	–	–	1	–
Newton,	39,642	12	1	3	2	1	–	–	–
Salem,	39,019	19	7	8	3	4	–	–	–
Haverhill,	38,362	24	4	13	7	1	–	–	1
Fitchburg,	34,263	13	2	5	1	3	–	–	–
Everett,	33,597	13	1	4	1	2	1	–	–
Quincy,	31,937	8	1	3	2	1	–	–	–
Taunton,	30,967	11	1	2	2	–	–	–	–
Waltham,	28,761	10	2	1	1	–	–	–	–
Pittsfield,	27,932	8	1	1	1	–	–	–	–
Brookline,	26,674	8	2	2	2	–	–	–	–
Gloucester,	26,011	7	–	1	–	1	–	–	–
North Adams,	22,150	4	2	2	2	–	–	–	–
Northampton,	21,075	7	2	2	–	–	–	–	–
Chicopee,	21,049	7	3	3	2	1	–	–	–
Medford,	20,921	5	–	1	1	–	–	–	–
Beverly,	16,386	8	–	3	3	–	–	–	–
Leominster,	16,030	7	4	5	2	1	1	–	–
Hyde Park,	15,609	8	3	2	1	1	–	–	–
Melrose,	15,459	4	0	2	2	–	–	–	–
Newburyport,	14,834	7	1	3	1	1	–	–	–
Revere,	14,820	3	1	1	1	–	–	–	–
Westfield,	14,750	9	2	4	2	–	–	–	–
Woburn,	14,522	5	0	1	1	–	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	0	–	–	–	–	–	–	–
Attleborough,	13,913	3	2	2	2	–	–	–	–
Adams,	13,685	5	2	4	4	–	–	–	–
Clinton,	13,105	3	0	–	–	–	–	–	–
Gardner,	13,066	5	1	1	–	1	–	–	–
Milford,	12,722	3	1	1	1	–	–	–	–
Watertown,	12,676	3	1	–	–	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	2	–	–	–	–	–	–	–
Weymouth,	11,798	4	–	1	–	–	–	–	–
Framingham,	11,749	4	2	2	1	1	–	–	–
Wakefield,	11,124	1	–	1	1	–	–	–	–
Webster,	11,109	3	1	–	–	–	–	–	–
Arlington,	10,520	3	1	–	–	–	–	–	–
Greenfield,	10,140	4	0	2	1	1	–	–	–
Recapitulation.									
Total of reporting towns,	2,401,701	895	236	323	169	72	8	6	9

WEEK ENDING MARCH 26, 1910.

CITIES AND TOWNS.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	265	64	93	36	35	3	1	2
Worcester,	136,476	52	9	14	11	1	1	–	–
Fall River,	106,486	41	19	8	2	–	1	–	–
Cambridge,	102,112	48	13	24	13	7	2	–	–
Lowell,	96,380	44	17	19	9	3	1	–	2
New Bedford,	85,516	43	18	15	12	1	1	–	–
Lynn,	84,623	30	4	13	6	6	1	–	–
Springfield,	84,237	36	9	12	5	4	1	–	1
Lawrence,	78,000	34	11	13	6	1	1	1	–
Somerville,	76,049	15	4	8	6	1	–	–	–
Brockton,	55,039	18	4	4	3	–	–	–	–
Holyoke,	53,590	23	8	7	3	3	–	–	–
Malden,	41,941	15	7	3	1	2	–	–	–
Chelsea,	40,080	14	3	6	5	1	–	–	–
Newton,	39,642	8	4	1	1	–	–	–	–
Salem,	39,019	16	–	3	3	–	–	–	–
Haverhill,	38,362	26	3	13	9	2	–	–	–
Fitchburg,	34,263	11	3	2	1	1	–	–	–
Everett,	33,597	8	2	1	–	1	–	–	–
Quincy,	31,937	11	3	5	4	1	–	–	–
Taunton,	30,967	16	5	9	4	–	–	1	–
Waltham,	28,761	11	5	6	2	2	1	–	–
Pittsfield,	27,932	5	2	1	1	–	–	–	–
Brookline,	26,674	3	1	–	–	–	–	–	–
Gloucester,	26,011	6	–	–	–	–	–	–	–
North Adams,	22,150	9	–	4	2	1	–	–	–
Northampton,	21,075	6	–	2	1	1	–	–	–
Chicopee,	21,049	5	1	2	2	–	–	–	–
Medford,	20,921	1	–	–	–	–	–	–	–
Beverly,	16,386	4	1	–	–	–	–	–	–
Leominster,	16,030	2	1	1	1	–	–	–	–
Hyde Park,	15,609	1	–	–	–	–	–	–	–
Melrose,	15,459	4	1	1	–	–	1	–	–
Newburyport,	14,834	4	1	4	4	–	–	–	–
Revere,	14,820	8	4	1	–	1	–	–	–
Westfield,	14,750	9	–	4	4	–	–	–	–
Woburn,	14,522	6	1	2	2	–	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	5	2	1	1	–	–	–	–
Attleborough,	13,913	8	4	6	4	1	–	–	–
Adams,	13,685	5	1	2	–	1	1	–	–
Clinton,	13,105	5	1	1	–	1	–	–	–
Gardner,	13,066	5	0	1	1	–	–	–	–
Milford,	12,722	2	0	1	–	1	–	–	–
Watertown,	12,676	2	1	1	1	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	8	2	3	–	–	–	1	–
Weymouth,	11,798	7	1	1	1	–	–	–	–
Framingham,	11,749	3	1	1	1	–	–	–	–
Wakefield,	11,124	1	–	–	–	–	–	–	–
Webster,	11,109	4	3	3	2	1	–	–	–
Arlington,	10,520	5	3	2	2	–	–	–	–
Greenfield,	10,140	–	–	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,391,561	918	247	324	172	80	15	4	5

WEEKLY RETURNS OF DEATHS FROM CERTAIN INFECTIOUS DISEASES.

DEATHS FROM INFECTIOUS DISEASES NOT SPECIFICALLY MENTIONED IN ABOVE TABLES DURING THE WEEKS OF MARCH 5, 12, 19 AND 26, 1910.

DISEASE.	Place.	WEEK ENDING—			
		Mar. 5.	Mar. 12.	Mar. 19.	Mar. 26.
Cerebro-spinal meningitis,	Boston,	–	1	–	1
	Lowell,	–	–	–	1
	Lynn,	–	–	1	–
	Worcester,	–	1	1	–
Scarlet fever,	Boston,	–	1	1	2
	Everett,	1	–	–	–
	Fitchburg,	–	–	1	–
	Lawrence,	–	2	–	–
	Lowell,	–	2	1	–
	Lynn,	–	1	–	–
	Malden,	1	2	–	–
	Northampton,	1	–	–	–
	Southbridge,	–	1	–	–
	Springfield,	3	2	3	–
	Worcester,	–	3	–	–
Whooping cough,	Boston,	1	–	–	–
	Haverhill,	–	1	–	–
	Lawrence,	–	–	–	2
	Salem,	–	–	1	–
	Springfield,	–	–	1	–
Erysipelas,	Boston,	2	1	3	3
	New Bedford,	–	–	1	–
	Northampton,	–	–	1	–
	Somerville,	–	1	–	–
	Worcester,	–	–	–	1
Tuberculosis other than pulmonary.	Boston,	4	6	4	3
	Brockton,	1	–	1	–
	Cambridge,	–	–	3	–
	Fall River,	1	–	–	2
	Lawrence,	1	–	3	1
	Leominster,	–	–	1	–
	Lowell,	1	–	–	2
	Malden,	1	–	–	–
	New Bedford,	–	–	–	1
	Newburyport,	–	1	1	–
	Northampton,	–	1	–	–
	Somerville,	3	–	–	–
	Southbridge,	–	–	–	2
	Waltham,	–	–	–	1
	Weymouth,	–	–	1	–
	Worcester,	1	3	1	–

DEATHS FROM INFECTIOUS DISEASES, ETC. — *Concluded.*

DISEASE.	Place.	WEEK ENDING— Mar. 5.	Mar. 12.	Mar. 19.	Mar. 26.
Influenza,	Boston,	2	4	2	1
	Cambridge,	1	–	–	–
	Fall River,	–	1	–	–
	Haverhill,	1	1	3	2
	Hyde Park,	1	–	–	–
	Lowell,	–	–	–	1
	Malden,	–	1	–	–
	Northampton,	–	–	1	–
	Somerville,	–	1	–	–
	Springfield,	–	–	1	1
	Westfield,	–	–	2	–
Meningitis other than cerebro-spinal.	Attleborough,	–	–	–	1
	Wakefield,	1	–	–	–
Tetanus.	Springfield,	–	1	–	–

WEEKLY RETURNS OF CASES OF INFECTIOUS DISEASES.

CASES OF INFECTIOUS DISEASES REPORTED DURING THE WEEKS OF MARCH 5, 12, 19 AND 26, 1910.

[Under the provisions of section 52 of chapter 75 of the Revised Laws.]

	WEEK ENDING— Mar. 5.	Mar. 12.	Mar. 19.	Mar. 26.	Total.
Diphtheria,	177	156	133	208	674
Measles,	694	698	655	697	2,744
Scarlet fever,	151	184	178	164	677
Typhoid fever,	56	33	21	27	137
Tuberculosis, pulmonary,	172	175	171	172	690
Tuberculosis other than pulmonary,	1	2	4	1	8
Cerebro-spinal meningitis,	–	2	2	5	9
Meningitis other than cerebro-spinal,	–	–	2	–	2
Whooping cough,	31	29	16	27	103
Varicella,	62	67	63	51	243
Erysipelas,[1]	–	–	–	1	1
Mumps,[1]	–	2	9	4	15
Ophthalmia neonatorum,	3	3	1	3	10
Smallpox,	2	–	2	–	4
Anterior poliomyelitis,	–	–	1	–	1
Tetanus,	–	1	–	–	1
Trachoma,	1	–	–	–	1
Malignant pustule,	–	–	–	1	1

[1] Erysipelas and mumps are not diseases notifiable under section 52 of chapter 75 of the Revised Laws. The figures concerning these diseases are, therefore, incomplete.

MONTHLY REPORT ON INSPECTION OF FOOD AND DRUGS.

The following summary presents the results of the examination of food and drugs made by the State Board of Health during the month of March, 1910: —

Articles examined.	Number found to be of Good Quality.	Number adulterated or varying from the Legal Standard.	Total.	Articles examined.	Number found to be of Good Quality.	Number adulterated or varying from the Legal Standard.	Total.
Butter,	16	7	23	Meat products: —			
Canned fruit and vegetables,	2	–	2	Hamburg steak,	10	3	13
Cheese,	2	–	2	Mincemeat,	4	–	4
Cider,	2	–	2	Sausages,	45	37	82
Cocoa,	13	–	13	Tripe,	1	–	1
Coffee,	5	–	5	Milk,	372	79	451
Condensed milk,	4	2	6	Olive oil,	15	10	25
Cream,	14	–	14	Oysters,	1	–	1
Cream of tartar,	5	–	5	Pastry,	1	1	2
Drugs,	72	17	89	Peanut butter,	10	–	10
Flavoring extracts,	9	1	10	Proprietary food,	1	–	1
Grape juice,	1	–	1	Pickles,	2	–	2
Honey,	6	–	6	Spices,	20	–	20
Jams and jellies,	6	–	6	Table sauce,	4	–	4
Lard,	52	46	98	Vinegar,	6	2	8
Malt liquor,	2	–	2	Wine,	2	–	2
Maple sugar,	19	2	21	Total,	724	207	931

The samples of drugs found to be adulterated were: spirit of anise, mercurial ointment and precipitated sulphur.

The cities and towns in which samples were collected were: Attleborough, Boston, Brockton, Cambridge, Chelsea, Chicopee, Concord, Danvers, Holyoke, Lawrence, Lenox, Lexington, Lowell, Ludlow, Lynn, Maynard, Milford, Middleborough, Natick, New Bedford, Newburyport, Newton, North Attleborough, Peabody, Pittsfield, Quincy, Revere, Salem, Springfield, Somerville, South Framingham, Sudbury, Taunton, Wakefield, Waltham, West Springfield and Woburn.

PROSECUTIONS FOR VIOLATIONS OF THE LAW RELATING TO FOOD AND DRUGS.

Thirty-nine convictions were secured during the month of March, 1910, for selling adulterated food and drugs, as follows: —

No.	Name of Defendant.	Place.	Character of Article sold.
1	Frank Harrington,	Boston,	Butter.[1]
2	George H. Kelton,	Boston,	Butter.[1]
3	James J. Kramer,	Boston,	Cocaine.
4	Benjamin Gresinovich,	Boston,	Hamburg steak.[2]
5	Frank Brailacques,	Boston,	Lard.[3]
6	Albert Cervizza,	Boston,	Lard.[3]
7	Pasquala Diffilippo,	Boston,	Lard.[3]
8	George Flemming,	Lowell,	Lard.[3]
9	Joseph H. Flynn,	Lowell,	Lard.[3]
10	Gaetano Gargaus,	Boston,	Lard.[3]
11	Joseph Goldenberg,	Boston,	Lard.[3]
12	Dominie Greger,	Brockton,	Lard.[3]
13	Terrance McDonald,	Lowell,	Lard.[3]
14	Nicholas Monahos,	Boston,	Lard.[3]
15	Dominie Naztro,	Boston,	Lard.[3]
16	Kazimie Okras,	Brockton,	Lard.[3]
17	Morris Oxman,	Boston,	Lard.[3]
18	Diano Pantoleon,	Boston,	Lard.[3]
19	Frank Pinto,	Lowell,	Lard.[3]
20	Daniel Sullivan,	Lowell,	Lard.[3]
21	Samuel D. Allen,	Bellingham,	Milk (total solids 6.00).[4]
22	Edwin A. Powers,	Sudbury,	Milk (total solids 6.80).[4]
23	Edwin A. Powers,	Sudbury,	Milk (total solids 6.83).
24	Albert L. Forbush,	Braintree,	Milk (total solids 11.18).[4]
25	Albert L. Forbush,	Braintree,	Milk (total solids 10.28).
26	Almouz Abdoullah,	Lowell,	Olive oil.[3]
27	Albert Cervizzi,	Boston,	Olive oil.[3]
28	Antonio Chaceleio,	Newton,	Olive oil.[3]
29	Dell Aria Giacomo,	Boston,	Olive oil.[3]
30	Nicholas Monahos,	Boston,	Olive oil.[3]
31	Dominie Naztro,	Boston,	Olive oil.[3]
32	Terrance McDonald,	Lowell,	Pork sausages.[5]
33	John E. Blake,	Brockton,	Spirit of anise.
34	Chas. H. Goldthwaite,	Brockton,	Spirit of anise.
35	Hall & Lyon,	Merrimac,	Spirit of anise.
36	Arthur M. Kelsey,	Brockton,	Spirit of anise.
37	Chas. N. Swift,	Brockton,	Spirit of anise.
38	Peter Bacicalupa,	Boston,	Wine vinegar.
39	Andrea Di Pietro,	Boston,	Wine vinegar.

[1] Oleomargarine.
[2] Contained sulphurous acid.
[3] Contained cotton-seed oil.
[4] Watered.
[5] Contained corn starch.

Fines imposed, $840.

LIST OF ADULTERATED OR IMPROPERLY LABELLED FOODS, ETC., FOR MARCH, 1910.

Number of Sample.	Character of Sample.	Name of Manufacturer, Wholesaler or Producer.	Results of Analyses.
11521	Olive oil,	"Savoia" Brand, Santarsiero & Telesca, U. S. A.,	Contains cotton-seed oil.
11522	Olive oil,	Olio Sopraffino Madonna Brand,	Consists of cotton-seed oil.
3755 R	Spirit of anise,	T. H. Farrell, Pittsfield, Mass.,	56 per cent. U. S. P. strength.
3757 R	Spirit of anise,	Fahey's Pharmacy, Pittsfield, Mass.,	63 per cent. U. S. P. strength.
11497	Spirit of anise,	Parmenter Pharmacy, Boston, Mass.,	75 per cent. U. S. P. strength.
3879 R	Spirit of anise,	A. W. Dows & Co., apothecaries, Lowell, Mass.,	58 per cent. U. S. P. strength.
11590	Spirit of anise,	Concord Drug Company, apothecaries, Lowell, Mass.,	48 per cent. U. S. P. strength.
11591	Spirit of anise,	East Merrimack Drug Company, Lowell, Mass.,	42 per cent. U. S. P. strength.
q 4568	Spirit of anise,	Charles W. King, Chicopee Falls, Mass.,	56 per cent. U. S. P. strength.
q 4483	Mercurial ointment,	Roma Pharmacy, Boston, Mass.,	63.4 per cent. U. S. P. strength.
q 4545	Milk,	S. Westley Young, Methuen, Mass.,	Total solids, 11.26 per cent.; fat, 2.65 per cent.; proteids, 3.14 per cent.; skimmed milk.
11732	Milk,	Edwin A. Powers, Maynard, Mass.,	Total solids, 6.96 per cent.; fat, 2.10 per cent.; contains added water.
11733			Total solids, 6.83 per cent.; fat, 2.00 per cent.; contains added water.
11734			Total solids, 6.80 per cent.; fat, 2.00 per cent.; contains added water.
11735			Total solids, 6.80 per cent.; fat, 2.00 per cent.; contains added water.
4171 R	Milk,	Thomas Lindsey, Watertown, Mass.,	Total solids, 10.86 per cent.; fat, 3.50 per cent.; contains added water.
4173 R	Milk,	Emma F. Whitney, Watertown, Mass.,	Total solids, 11.20 per cent.; fat, 3.80 per cent.; contains added water.
4175 R			Total solids, 10.40 per cent.; fat, 3.40 per cent.; contains added water.
11794	Milk,	D. Bergeron, Brockton, Mass.,	Total solids, 10.66 per cent.; fat, 3.30 per cent.; contains added water.

INSPECTION OF DAIRIES.

During the month of March, 1910, 240 dairies were examined in the following places: —

Place.	Number examined.	Number found to present no Objectionable Features.	Per Cent.	Number concerning which Letters were sent.	Per Cent.
Bolton,	6	3	50.00	3	50.00
Second inspection,	34	25	73.53	9	26.47
Harvard,	–	–	–	–	–
Third inspection,	1	1	100.00	–	–
Hudson,	–	–	–	–	–
Third inspection,	1	–	–	1	100.00
Littleton,	3	3	100 00	–	–
Second inspection,	3	3	100 00	–	–
Third inspection,	47	37	78 72	10	21.28
Fourth inspection,	6	5	83.33	1	16.67
Methuen,	1	–	–	1	100.00
Second inspection,	72	45	62.50	27	37.50
Milton,	–	–	–	–	–
Second inspection,	20	15	75.00	5	25.00
Northborough,	4	2	50.00	2	50.00
Second inspection,	4	3	75.00	1	25.00
Third inspection,	3	–	–	3	100.00
Randolph,	1	1	100.00	–	–
Second inspection,	14	11	78.57	3	21.43
Westborough,	1	1	100.00	–	–
Second inspection,	2	2	100.00	–	–
Weymouth,	2	1	50.00	1	50.00
Second inspection,	15	10	66 67	5	33.33

Total number of dairies examined,	240
Number found to be free from objectionable conditions,	168
Number concerning which letters were sent,	72
Total number of conditions to which attention was called,	218
Percentage of dairies which passed inspection,	70.00

In addition to the above, 98 dairies were visited at which the sale of milk has been discontinued.

The names of the owners of the dairies found to be worthy of commendation follow: —

Bolton.

Balcom, Ezra A.*
Brigham, G. L.*
Brigham, William M.*
Brown, M.
Carr, Arthur*
Carruth, E.
Cragg, M. R.*
Cunningham, Paul*†
Daniels, Miss C. J.*†
Dow, George E.*
Dow, J. G.*
Edes, F. C.*
Hamblin, F. J.*†
Haynes, O. W.*
Hemenway, L. A.*†
Mace, C. E.*
Newton, G. B.*†
Newton, H. B.*
Nourse, A. L.*
Partridge, C. E.
Randall, R. E.*
Sampson, G. A.*
Sawyer, E. N.*
Schartner, Julius*
Underwood, O. S.*
Wheeler, Charles C.*†
Wheeler, F. A.*†
Wheeler, James D.*

Harvard.

Newton, Stanley E.‡

* Second inspection. † Reported favorably on first inspection. ‡ Third inspection.

Littleton.

Babcock, George‡
Barrows, R. T.‡
Brown, Marshall‡
Brown, W. G.‡
Burnham, H. O.‡
Cash, G. H.‡
Cook, George A.‡
Cooper, Henry J.*
Farwell, O. W.§
Flagg, Clifton E.‡
Flagg, C. V.‡
Flagg, W. H.‡
Hall, David H.
Hall, W. W.‡
Hartwell, Charles A.‡
Harwood, H. J.‡
Houghton, D. G.‡
Johnson, C. H.
Kimball, Austin‡
Kimball, Charles A.‡
Kimball, Fred S.‡
Kimball, Walter‡
Littleton Town Farm‡
Mannion, Thomas J.‡
McNiff, Michael‡
McNiff, Patrick‡
Moore, A. V.‡
Moore, Thomas‡
Morse, R. P.‡
Nixon, James‡
Pickard, William S.
Pingree, F. O.‡
Priest Bros. (Village Farm)§
Proctor, George H.‡
Proctor, William‡
Prouty, Gardner*
Robbins, H. W.‡
Robinson, E. N.‡
Sanderson, G. W.§
Stone, G. F.‡
Stone, L. J.‡
Titcomb, Walter H.‡
Tobin, William S.‡
Wainwright, Joseph§
Wesley, Edward‡
Whitcomb, J. H. D.§
Whitcomb, N. H.‡
Works, H. F.‡

Methuen.

Austin, J. B.*
Bishop, Victor*
Bodwell, Frank*†
Bodwell, Willard*†
Boletti, Corso*†
Bragdon, E. L.*†
Bryant, Edwin S.*†
Cohn, Jeremiah*†
Cole, G. M.*
Connelly, Dennis F.*†
Courtney, James*†
Cross, George L.*†
Currier, Fred L.*
Fogg, William P.*
Foster, F. W.*†
Frost, William*
Giles, John H.*†
Griffin, Henry*
Harnisch, A.*
Hoh, John W.*
Kimball, Edward*
Lippold, Carl L.*
Merrill, Joseph E.*
Methuen Town Farm*†
Morse Bros.*†
Neeley, Robert*†
Nelson, D. D.*†
Nice, Benjamin*†
Noyes, Minna*
Richardson, Charles E.*
Richardson, Edwin*
Richardson, J. B.*†
Richardson, V. B.*
Russell, F. A.*
Stevens, Charles*†
Stevens, George*†
Stickney, Fred W.*†
Taylor, E. D.*
Taylor, George*
Warren, Isaac*†
Webster, George K.*†
Welch, Silas P.*†
Whittier, H. A.*
Williams, William*†
Young, Clarence E.*

Milton.

Bowley, H. L.*
Campbell, John*
Copeland, Charles C.*
Dennis, W. S.*†
Farrington, J. Henry*†
Fenno, J. P.*†
Jessup, Charles F.*
Manning, M. J.*
Marshall, A.*†
Murray, Michael W.*†
Pond, Joseph W.*
Reynolds, J. H.*
Russell, Mrs. H. S.*†
Sanford, A. R.*
Thayer, Charles H.*

Northborough.

Bemis, J. W.
Dean, Edwin L.*†
Fredericks, Fritz*†
Peter, Simon
Pikard, F. B.*

Randolph.

Clark, Patrick F.
Cole, Charles H.*†
Ferguson, J. G. & R. G.*†
Hunt, Joshua*
Lothrop, E. E.*
Mann, W. L.*
Nelson Bros.*†
Powers, Charles R.*†
Thayer, Rufus A.*
Wales, Frank*†
Wales, John*†
Willard, J. K.*

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* Second inspection.
† Reported favorably on first inspection.
‡ Third inspection.
§ Fourth inspection.

Westborough.

Haven, A. J.* Hero, B. W. Kovilesky, S.*

Weymouth.

Cohan, Denis* Mowry, C. B. Thompson, John H.*†
Cowan, Frank*† Richards, Henry* Tirrell, Austin*†
Coyle, Hugh P.* Sherman, J. H.* Weymouth Town Farm*
Loud, F. W.*† Sherrick, F. J.*

SCARLET FEVER PROPHYLAXIS WITH STREPTOCOCCUS VACCINE.[1]

By Richard M. Smith, M.D., Boston.

[Note. — This work was suggested by Dr. Mark W. Richardson, secretary of the State Board of Health. The financial support was provided by Mr. Frederick W. Lord of New York.]

The first work in scarlet fever prophylaxis of which any mention has been found was that done by Stickler in 1883. He took the blood of a scarlet fever patient and injected it into himself, and in three days had an eruption like scarlet fever, followed by desquamation. Then he took the desquamated scales from a scarlet fever patient and injected them into healthy individuals, causing no reaction except a local hyperemia; but if later the people received injections of blood from a scarlet fever patient, there was no eruption or desquamation. This method never received much recognition. The next work on the subject was done by Gabritschewsky, first reported in 1905, by the use of streptococcus vaccines. Nearly all the published accounts are in Russian, so that the method has come very little to the attention of the profession generally but the results are sufficiently suggestive to warrant a wider trial. Whether it is really as satisfactory as is claimed by its advocates can only be known by further experimentation.

The reasonableness of the use of streptococcus vaccine in scarlet fever would seem to be dependent upon the acceptance of the streptococcus as the cause of scarlet fever, and perhaps it would not be out of place to review briefly some of the arguments advanced in support of this view. Klein, in 1885, was the first to advocate the streptococcus as the specific cause of scarlet fever; and since that time there has been a continual discussion as to whether it was the cause of the disease or only involved in

* Second inspection. † Reported favorably on first inspection.

[1] Read at a meeting of the New England Pediatric Society, Jan. 29, 1910. Reprinted from the "Boston Medical and Surgical Journal" for Feb. 24, 1910.

the complications, and so played a secondary rôle. The particular streptococcus claimed to be the etiological factor in scarlet fever is named the "streptococcus conglomeratus," and is characterized chiefly by producing a rash in animals and men who are injected with it. The first argument for its specific action in scarlet fever is the constant finding of streptococci in the throat of scarlet fever patients, the frequency with which streptococci can be isolated from blood cultures of scarlet fever patients made during life, the almost sure presence of the organism in scarlet fever patients post-mortem and the fact that the complications and death in the majority of cases of scarlet fever are due to the invasion of the streptococcus.

A second argument for the primary rôle of the streptococcus is the presence in the blood of scarlet fever patients of an agglutinin for the streptococcus. There is some difference of opinion as to whether this substance really exists, but the weight of opinion seems to be in its favor, some men even tracing a disappearance of the reaction toward the end of convalescence. Moser and Pirquet found a positive reaction in 50 per cent. of cases between the serum of scarlet fever patients and a culture of streptococcus isolated from the heart blood of a child dying of scarlet fever, in a maximum dilution of 1:8, but a negative reaction in all but 3 of 28 control cases, or 10 per cent., in a maximum dilution of 1:4. Experimentally, by injection into the horse, they were able to produce the reaction in dilutions 1:64,000, but a control was negative in dilutions higher than 1:64. Weaver could not confirm these observations and does not think the reaction is very specific. In this connection may be mentioned the fact that in the hands of many observers there is a complement binding preventing hemolysis during the early stages of the disease. Foix and Mallien obtained a positive result in 10 out of 12 cases, and Livierato, in every case tried, with a negative finding in all the controls. Schleisser and others have not had such uniform results. Tunnicliff, working in Hektoen's laboratory, has found a lowering of the streptococcic opsonic index in scarlet fever patients in acute stages of the disease, with a return to normal as the symptoms subside. This is especially noticed in the severe and fatal cases (Banks) and in the complications.

Still further in favor of the primary rôle of the streptococcus is the apparent benefit which comes from the use of serum prepared by the injection into the horse of streptococci from scarlet fever patients. Of this serum McCullom says, "It does no harm, and may do good." Abroad, where it has been used much more extensively than here, it is claimed that the mortality of scarlet fever is greatly reduced, 47.4 per cent. to 16.1 per cent. in severe cases; 15 per cent. to 8 per cent. in all cases; and the complications, except nephritis, lessened. Some little work on the

use of the serum in prophylaxis has been done, and the results thus far given are favorable.

Whether these arguments for the specificity of the streptococcus are convincing, whether we believe that some parasite is the cause of scarlet fever, or whether we believe the etiological factor in scarlet fever has not yet been discovered, the work done in prophylaxis by the use of vaccines is interesting. These results from its use are believed by many to establish the primary rôle of the streptococcus in scarlet fever. As Gabritschewsky says, we vaccinate against smallpox and use prophylactic means against rabies, without knowing the exact cause of the disease; why not also in scarlet fever?

Gabritschewsky first began his researches by working on horses with the disease known as strangles, due to a streptococcus and simulating in many ways scarlet fever in man. The results were so encouraging that he then attacked the problem in human beings, first injecting himself with the vaccine to be sure no unfortunate results would follow, then, making wider applications.

Preparation of the Vaccine. — He used a concentrated bouillon culture of the streptococcus isolated from a person ill with scarlet fever, killed by heating to 60° C., with the addition of 0.5 per cent. carbolic acid. Sometimes a glucose bouillon was used, but only rarely, and the plain bouillon was finally accepted as the better preparation. Each cubic centimeter of this culture contained 0.02 to 0.03 ccm. of sediment; of this 0.02 ccm. equaled 0.005 gm. of dried sediment.

Dose. — There are two chief scales of dosage, modified slightly by the individual workers, both given subcutaneously in the abdomen, thigh, back or arm. The first one, used by Gabritschewsky and by the majority of other men, is 0.5 ccm. of the concentrated bouillon culture in children two to ten years old. For those younger, half this amount, and adults, twice this amount, is used.

The other method is 0.1 ccm. for each year of the child's age, with 0.25 ccm. as the minimum and 1 ccm. as the maximum.

The dose should be repeated twice in seven to ten day intervals, the dosage increased at each injection one and a half to two times the previous dose.

Contra-indications. — The only cases in which the vaccines are withheld are (1) in those having a high temperature; and recently, since the conviction that no harm is done has been established, even these have received doses without evident untoward results; (2) in very young infants or patients who from some cause or other are greatly exhausted; and (3) in those having nephritis.

Immunity. — It is claimed that after three doses of the vaccine, and

usually after two, a complete immunity is established against scarlet fever. This immunity is not fixed until five to seven days after the last dose, though a relative immunity probably exists at the end of a week following the first injection. The duration of this immunity is, of course, entirely a matter of speculation, as the vaccines have been in use too short a time to make any definite deductions possible. The most severe critic of the vaccine method, Strulpoff, in fact, the only one who objected at all to these prophylactic inoculations, acknowledges an immunity lasting six to seven months. It is thought by those who have seen the most cases that immunity probably remains at least one and a half years.

Reactions. — Following the injection of the vaccine, in the majority of cases there appears in about twenty-four hours at the site of the inoculation, an area of redness and infiltration, roughly 15 cm. in diameter, somewhat painful and tender, lasting about one to three days, rarely a week, and then entirely disappearing, leaving no permanent lesion. In a very few cases, a fraction of 1 per cent., this local condition went on to abscess formation, but it is hardly fair to blame the vaccines, since an occasional slip in asepsis is not uncommon in other subcutaneous inoculations. With the local reaction, coming on six or eight hours after the injection, there is usually a little rise in temperature, not over 1° C., with some headache and general malaise. A few of the cases have vomiting.

In a small percentage of cases, 10 per cent. to 15 per cent., quite a different reaction occurs. Twenty-four hours after the injection there appears on the chest and abdomen, sometimes extending also over the rest of the body, a punctate erythema very much like the eruption of scarlet fever — in fact, by some men mistaken for the disease — but not followed by any desquamation. This eruption lasts one to three days, and may be accompanied by sore throat, some swelling of the lymph glands and often a so-called "strawberry tongue." Rarely this may be a rather severe condition, with high fever, a little albumen in the urine and marked prostration, but it rapidly disappears without permanent harm.

After the second injection there may be reaction, but usually much less than after the first, often none at all; and after the third injection there are rarely any unpleasant features. The longer the interval between the injections, the more frequently will there be a reaction to the second and third, but the reactions are less severe. The interval of a week is considered the most satisfactory.

The quantity of the vaccine used is believed by most men to have no influence on the severity of the reactions, but Smirnoff, who had unusually few reactions in his series of cases, says it was because he used smaller doses.

A few cases have given no reaction, local or general. In this class are those who have had scarlet fever previously, and those who, as we say in smallpox vaccination, "didn't take."

The only really bad case of which any report could be found, and over 50,000 vaccinations have been made, was of a child two and a half years old, who had a severe nephritis and died on the third day after injection. Zelikin, who reported the case, thinks the injection was given to this child when she was already in the incubation stage of scarlet fever, though many other men have given the vaccine at this time and do not think any harm is done.

Reports of the Use of the Vaccine

Smirnoff used the vaccine in thirteen small villages in Russia, where the sanitary conditions were very poor and there was no possibility of any quarantine, the most favorable environment for the spread of scarlet fever. He began his injections June 23, and in the villages where he used it no new cases were reported after the middle of July, but in the other villages the epidemic was not over till the middle of September, two months later. In one village there were 34 unvaccinated children, of whom 24, or 70.6 per cent., had scarlet fever; 48 vaccinated children, of whom 4, or 8.3 per cent., had scarlet fever. Of these 4, 3 came down within a week after the first inoculation, and the other one five days after the second inoculation, too soon for immunity to have been established.

In another village there were 45 uninoculated, of whom 6, or 13.3 per cent., had scarlet fever; 56 inoculated, of whom 1, or 1.7 per cent., had scarlet fever. This 1 case came down the sixth day after the first inoculation.

Again, 12 unvaccinated, of whom 6 had scarlet fever, or 50 per cent.; 23 vaccinated, of whom none had scarlet fever, or 0 per cent.

This is especially interesting because some children in the same families were inoculated and some not; the unvaccinated had the disease, and some died. In one case only one member of a family was vaccinated, a girl of ten, and all the rest of the family, including the parents, later had the disease, but she escaped, and there was no quarantine.

Although Smirnoff vaccinated 455 cases, only a part of them would allow second injections. His results are as follows: —

Vaccinated 1 injection	= 285 cases	= 5 cases	of scarlet fever.
Vaccinated 2 injections	= 148 cases	= 2 cases	of scarlet fever.
Vaccinated 3 injections	= 22 cases	= 0 cases	of scarlet fever.
	455	7	

Of the 7 cases —

3 were within 7 days of first vaccination.
2 were within 7 days of second vaccination.

5

Villages without vaccination: 20 per cent. contracted scarlet fever, 11.1 per cent. died; villages with vaccination: 3.7 per cent. contracted scarlet fever, 0 per cent. died.

Yemelyanoff worked in an epidemic in Kharkow in which there were 8 or 10 new cases reported every day, nearly every house in the district being infected. Quarantine regulations could not be enforced. He vaccinated 317 cases himself, his assistants 293, making in all 610 cases. Of these, not a single one contracted the disease. Often it was possible to keep the schools open in certain districts where vaccination was used, even though the children came from infected houses.

Dorofeyeff had three small villages under his care, in two of which he used the vaccine. For the nine days previous to his injections there were 21 new cases reported; for the nine days after the first injection only 4; no new cases after the third injection. He injected 142 cases, 2 of whom had scarlet fever on the seventh and ninth day after injection. They were very mild cases, without complications, but in the general epidemic 80 per cent. of cases had nephritis. In the treated villages the epidemic was over November 2, only 1 case appearing after that date. In the untreated village, 18.5 per cent. of the children had the disease, and cases continued until the middle of December.

Zelikin used vaccines in country practice where there was a very severe epidemic, 210 cases being reported, with a death-rate of 30 per cent. to 35 per cent. of cases. He made 741 vaccinations. One hundred and twenty-eight had one vaccination; 4 had scarlet fever, or 3.1 per cent. with 1 death; 613 had two vaccinations; none had scarlet fever.

This death is the one reported before as receiving an injection during the incubation period of the disease and having acute nephritis.

Markuzon, in 1906, began injecting all the cases admitted into the hospital under his care in Moscow, except those showing the contra-indications mentioned before. It is interesting to note that the injections given to patients with typhoid, pneumonia, etc., had no effect upon the course of the disease, and caused only a temporary rise in temperature. He injected 150 cases, 50 of them only once. None of those having two inoculations had the disease, and the few who had it after one inoculation ran a very mild course.

Lifshitz gave 170 cases 243 vaccinations, only 3 receiving three doses. It was in the midst of a severe epidemic. In one of the villages 17 cases

were reported in one week. Then there was a general vaccination, with no new cases after it. Only 3 of the people vaccinated had scarlet fever, 1 of these four days after first injection.

Nikitin reports these cases: —

528	vaccinated 1 injection	= 8	had scarlet fever.
106	vaccinated 2 injections	= 0	had scarlet fever.
149	vaccinated 3 injections	= 0	had scarlet fever.
783			

In the villages not vaccinated, 16 per cent. of children had scarlet fever; in the villages vaccinated, 1.4 per cent. of children had scarlet fever.

Pratonoff had 52 cases, 2 of whom came down with scarlet fever, 1 very soon after the injection; the other case by many physicians was considered a reaction rash and not true scarlet fever.

Akaparoff had —

123	given 1 vaccination	= 3	had scarlet fever on second day.
100	given 2 vaccinations	= 0	had scarlet fever.
85	given 3 vaccinations	= 0	had scarlet fever.
308		3	

Perwoff reports —

231	vaccinated 1 injection	= 2	cases of scarlet fever.
51	vaccinated 2 injections	= 0	cases of scarlet fever.
282			

Wasileff had 15 vaccinations; 2 cases of scarlet fever the day after the injection.

Neurzoft had 173 vaccinations; 2 cases of scarlet fever the second day after injection.

Langovoy reports the use of vaccines in a hospital in Moscow where, during the four years previous, 3 per cent. of the children in the wards had scarlet fever. Since its use, covering a period of several years, there have been only 4 cases among 309 children, or 1.2 per cent.

Schwarin gave 497 cases vaccines, only 2 of whom had scarlet fever.

Orloff injected 45 cases, none of whom had scarlet fever.

Eskoff injected 34 cases, none of whom had scarlet fever.

Dobenesky injected 132 cases, none of whom had scarlet fever.

Tettno injected 23 cases, none of whom had scarlet fever.

From these published accounts it would seem that

1. The streptococcus vaccines, used as advocated by Gabritschewsky, have some influence in controlling epidemics of scarlet fever.

2. Their use, with proper care, is attended by no harmful results.

3. They should be given a wider application in this country, to prove or disprove the contentions of the Russian physicians.

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SMALLPOX IN WAKEFIELD, READING, STONEHAM AND MELROSE.

On Jan. 8, 1910, the board of health of Wakefield called to the attention of the State Inspector of Health of the north metropolitan district a case of smallpox in that town. Investigation of this case and the cases preceding and following it showed that a total of 54 cases occurred in Wakefield, 29 in Lynn, 5 in Stoneham, and 1 in Melrose. Twenty-five of the cases were among children under ten years of age. Of the total number of persons stricken 46 were females and 43 males.

The first case concerning which any history was obtained was that of a woman, M. B., twenty-three years of age, who was taken ill on Sept. 27, 1909, never having been vaccinated. Her sisters, B and D., were taken ill on October 10 and 18, respectively. Of these 3 patients the first, M. B., was attended by a physician who diagnosed her illness as influenza. Later, when an eruption appeared, the patient was seen in consultation with another physician, and it was decided that she had chickenpox. A careful examination of these 3 patients later on (January 20), however, showed unmistakable evidence of the remains of smallpox eruptions on the face and forearms of each. The patients had all worked at the Harvard Knitting Mill, and, because of failure to recognize the presence of smallpox, formed a source of infection to other persons with whom they came in contact.

On November 13 a man, E. S., thirty years of age, employed at the same mill, was taken ill with the disease. He also had consulted a physician, who diagnosed his illness as influenza.

On December 1 another employee at the knitting mill, L. L., was taken ill with smallpox, although unattended by any physician, and on December 15 5 other members of her family had symptoms consistent with the disease. An examination made on February 11 showed positively that all these persons had been stricken with the disease.

On December 9 another employee at the knitting mill, M. F., had symptoms of smallpox, and on December 24, January 10, 11 and 17, 4 other members of the same family were taken ill. An examination made on January 19 showed that they also had the disease.

On December 9 another employee, E. K., and on the 25th her brother, J. K., showed symptoms of the disease, both cases having been unrecognized.

On December 15 a woman, M. M., and on the 21st her sister, M. M., both employed at the knitting mill, contracted smallpox, and later 7 other persons in the same family showed symptoms of the disease, being stricken in the period between December 25 and January 6. In the same house 6 members of another family contracted the disease during the period between December 25 and January 23.

On December 21 another employee at the knitting mill, C. G., was taken ill with smallpox, and later, between December 26 and January 9, 4 other members of her family were stricken. In an adjoining house, where a relative lived, 3 members of the family were stricken between January 17 and February 5. The first group of cases was unrecognized, but the last 3 cases — occurring at a time when a definite diagnosis of smallpox had been made — were recognized.

On December 21 another employee at the knitting mill, R. C., was taken ill with the disease, and during the period between January 3

and 12, 4 other members of the family were stricken, the first being unrecognized.

A. C., stricken December 22; P. F., December 24; A. M., December 27 (the latter infecting her mother, who was taken ill on February 6); M. W. and V. S., January 2; A. F., January 12; and L. W., January 14 (whose father was ill on February 1) — all worked at the Harvard Knitting Mill.

With this widespread infection existing unrestricted from Sept. 27, 1909, until Jan. 8, 1910, it was expected that other persons would contract the disease, and at the house of L. B., where E. S. visited, 3 of the family were ill between December 10 and 25, and 4 members of the family in an adjoining house were ill between January 1 and 11. Two other persons, R. M., who visited the house of L. B., in December, and L. S., who visited the same house, were taken ill on December 24 and January 9, respectively. R. M. lived at Stoneham, and 2 members of his family were stricken with the disease on January 12 and 17. A man who lived in an adjoining house and another man who worked on the same premises were taken ill on January 12 and 30, respectively.

D. B. was taken ill with smallpox on January 1 and her mother and brother were stricken on January 12. K. C. was taken ill on December 25 and 7 other members of her family were ill with the disease between January 10 and February 2. V. B. and H. B. were stricken on December 25 and 26, respectively, and another member of the family had the disease on January 8.

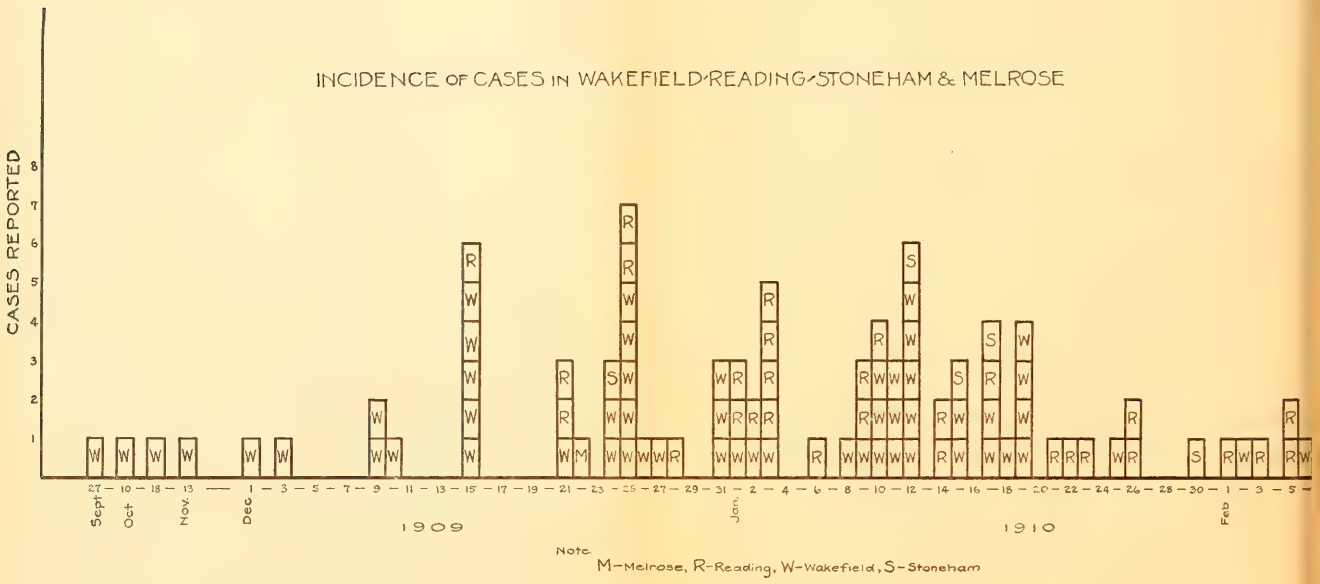
Two persons in another family were stricken with smallpox on December 31 and January 17, respectively. Six other cases occurred in different families between January 1 and February 11, inclusive.

When it was apparent to the boards of health of the towns of Reading, Wakefield, Stoneham and Melrose that smallpox was so widespread the most stringent measures were taken to control the epidemic. At Reading a house in which most of the cases existed was used for a hospital, the well members of the family being removed and patients in other families being transferred therein. At Wakefield the board of health obtained the use of a house owned by the town, situated on the shores of Lake Quannapowitt, and fitted it for a hospital. The building was opened for smallpox patients on January 12. At Stoneham the patients were cared for in the houses where they lived. Only 1 case occurred in Melrose. The health authorities of the towns of Wakefield and Reading closed the schools and churches and prohibited all public entertainments. Vaccination was ordered in all of the manufacturing establishments in each town, and free vaccination stations were opened at the town halls, with the result that practically all the inhabitants were vaccinated in the course of

a few days. With such extensive restrictions, notwithstanding the widespread character of the disease, the infection showed signs of immediate

the boards of health in towns, or by selectmen acting as such boards.

SECTION 2. This act shall take effect upon its passage. [*Approved February 28, 1910.*


INCIDENCE OF CASES IN WAKEFIELD-READING-STONEHAM & MELROSE
CASES REPORTED
1 2 3 4 5 6 7 8
27 — 10 — 18 — 13 — 1 — 3 — 5 — 7 — 9 — 11 — 13 — 15 — 17 — 19 — 21 — 23 — 25 — 27 — 29 — 31 — 2 — 4 — 6 — 8 — 10 — 12 — 14 — 16 — 18 — 20 — 22 — 24 — 26 — 28 — 30 — 1 — 3 — 5
Sept
Oct
Nov
Dec
Jan.
Feb
1909
1910
Note.
M-Melrose, R-Reading, W-Wakefield, S-Stoneham

a few days. With such extensive restrictions, notwithstanding the widespread character of the disease, the infection showed signs of immediate abatement, and the epidemic was well under control. The hospital at Wakefield was closed on March 5, and the last visit was made for patients at Reading on March 11.

During the entire epidemic only 9 of the 90 persons stricken were found to have been vaccinated. Of this number 8 were between the ages of twenty and eighty-four, and had not been vaccinated since childhood. One girl, eleven years of age, who was vaccinated six years previously and showed only a slight scar, had the disease in a mild form.

In addition to the 90 cases of smallpox, above mentioned, 48 visits were made to patients who were reported as being possibly infected with the disease. During the epidemic 32 daily visits were made to the towns wherein the disease spread, for the purpose of assisting the local health authorities in controlling infection.

COMPENSATION OF INSPECTORS AND COLLECTORS OF MILK.

Acts of 1910, Chapter 114.

An Act relative to the compensation of inspectors and collectors of milk.

Be it enacted, etc., as follows:

Section 1. Section one of chapter four hundred and five of the acts of the year nineteen hundred and nine is hereby amended by striking out the words "selectmen in towns appointing them", at the end thereof, and inserting in place thereof the words: — boards of health in towns, or by selectmen acting as such boards, — so as to read as follows: — *Section 1.* The boards of health of cities shall, and boards of health of towns or the selectmen acting as such boards, may, appoint one or more inspectors of milk for their respective cities and towns. In cities such inspectors, after appointment, may be removed from office in accordance with the provisions of chapter three hundred and fourteen of the acts of the year nineteen hundred and four; in towns they may be removed at any time by the appointing board. Such inspectors shall have the powers and perform the duties now conferred and imposed by law upon the inspectors of milk, but they shall be under the control of the boards of health appointing them, and shall perform such other duties as the said boards may designate. Their compensation shall be determined by the boards of health in cities, and by the boards of health in towns, or by selectmen acting as such boards.

Section 2. This act shall take effect upon its passage. [*Approved February 28, 1910.*

MEDICAL INSPECTION OF WORKING CHILDREN.

ACTS OF 1910, CHAPTER 257.

AN ACT TO PROVIDE FOR MEDICAL INSPECTION OF WORKING CHILDREN BETWEEN THE AGES OF FOURTEEN AND SIXTEEN.

Be it enacted, etc., as follows:

SECTION 1. Section one of chapter five hundred and two of the acts of the year nineteen hundred and six is hereby amended by inserting after the word "act", in the sixth line, the words: — and shall assign one or more to perform the duty of examining children who apply for health certificates in accordance with this act, — so as to read as follows: — *Section 1.* The school committee of every city and town in the commonwealth shall appoint one or more school physicians, shall assign one to each public school within its city or town, and shall provide them with all proper facilities for the performance of their duties as prescribed in this act; and shall assign one or more to perform the duty of examining children who apply for health certificates in accordance with this act: *provided, however,* that in cities wherein the board of health is already maintaining or shall hereafter maintain substantially such medical inspection as this act requires, the board of health shall appoint and assign the school physician.

SECTION 2. Section two of said chapter five hundred and two is hereby amended by adding at the end thereof the words: — Every school physician who is assigned to perform the duty of examining children who apply for health certificates shall make a prompt examination of every child who wishes to obtain an age and schooling certificate, as provided in section sixty of chapter five hundred and fourteen of the acts of the year nineteen hundred and nine, and who presents to said physician an employment ticket, as provided in said section, and the physician shall certify in writing whether or not in his opinion such child is in sufficiently sound health and physically able to perform the work which the child intends to do, — so as to read as follows: — *Section 2.* Every school physician shall make a prompt examination and diagnosis of all children referred to him as hereinafter provided, and such further examination of teachers, janitors and school buildings as in his opinion the protection of the health of the pupils may require. Every school physician who is assigned to perform the duty of examining children who apply for health certificates shall make a prompt examination of every child who wishes to obtain an age and schooling certificate, as provided in section sixty of chapter five hundred and fourteen of the acts of the year nineteen hundred and nine, and who presents to said physician an employment ticket, as provided in said section, and the physician shall certify in writing whether or not in his opinion such child is in sufficiently sound health and physically able to perform the work which the child intends to do.

SECTION 3. Section fifty-eight of chapter five hundred and fourteen of the acts of the year nineteen hundred and nine is hereby amended by insert-

ing after the word "language", in the twelfth and thirteenth lines, the words: — nor until such person has received a certificate signed by a physician, as provided in chapter five hundred and two of the acts of the year nineteen hundred and six and acts passed in amendment thereof, or by a physician appointed by the school committee, stating that said minor has been examined by him and in his opinion is in sufficiently sound health and physically able to perform the work which the minor intends to do: *provided, however,* that the age and schooling certificate may be approved and issued without a physician's certificate if there shall be on file in connection with the public schools a written record in regard to the child's physical condition made within one year and the person authorized to approve said age and schooling certificate after having examined such record shall certify that in his opinion said minor is in sufficiently sound health and physically able to perform the work which the minor intends to do, — so as to read as follows: — *Section 58.* An age and schooling certificate shall be approved only by the superintendent of schools or by a person authorized by him in writing, or, if there is no superintendent of schools, by a person authorized by the school committee; but no member of a school committee or other person authorized as aforesaid shall approve such certificate for any minor then in or about to enter his own employment or the employment of a firm or corporation of which he is a member, officer or employee. No such certificate shall be approved by any person unless he is satisfied that the minor therein named is able to read at sight and to write legibly simple sentences in the English language, nor until such person has received a certificate signed by a physican, as provided in chapter five hundred and two of the acts of the year nineteen hundred and six and acts passed in amendment thereof, or by a physician appointed by the school committee, stating that said minor has been examined by him and in his opinion is in sufficiently sound health and physically able to perform the work which the minor intends to do: *provided, however,* that the age and schooling certificate may be approved and issued without a physician's certificate if there shall be on file in connection with the public schools a written record in regard to the child's physical condition made within one year and the person authorized to approve said age and schooling certificate after having examined such record shall certify that in his opinion said minor is in sufficiently sound health and physically able to perform the work which the minor intends to do. The person who approves the certificate may administer the oath provided for therein, but no fee shall be charged therefor.

Section 4. The age and schooling certificate set forth in section sixty of said chapter five hundred and fourteen is hereby amended by inserting after the word "language", in the thirty-eighth line, the words: — I further certify that in my opinion (or in the opinion of the physician by whom said minor has been examined in accordance with section fifty-eight of the above chapter) he (or she) is in sufficiently sound health and physically able to perform the work which he (or she) intends to do, — so that the said certificate will read as follows: —

AGE AND SCHOOLING CERTIFICATE, ST. 1909, C. , SEC. .

This certifies that I am the [father, mother, guardian or custodian] of [name of minor], and that [he or she] was born at [name of city or town], in the county of [name of county, if known], and state [or country] of , on the [day and year of birth], and is now [number of years and months] old.

[Signature of father, mother, guardian, or custodian.]

[City or town and date.]

Then personally appeared before me the above-named [name of person signing], and made oath that the foregoing certificate by [him or her] signed is true to the best of [his or her] knowledge and belief. I hereby approve the foregoing certificate of [name of minor], height [feet and inches], complexion [fair or dark], hair [color], having no sufficient reason to doubt that [he or she] is of the age therein certified. I hereby certify and am satisfied that [he or she] can read at sight and can write legibly simple sentences in the English language. I further certify that in my opinion [or in the opinion of , the physician by whom said minor has been examined in accordance with section fifty-eight of the above chapter] he [or she] is in sufficiently sound health and physically able to perform the work which he [or she] intends to do.

This certificate belongs to [name of minor in whose behalf it is drawn], and is to be surrendered to [him or her] whenever [he or she] leaves the service of the corporation or employer holding the same; but if not claimed by said minor within thirty days after such time, it shall be returned to the superintendent of schools, or, if there is no superintendent of schools, to the school committee.

[Signature of person authorized to approve and sign, with official character or authority.]

[City or town and date.]

In the case of a minor who cannot read at sight and write legibly simple sentences in the English language, the certificate shall continue as follows, after the word "language": —

I hereby certify that [he or she] is regularly attending the [name] public evening school. This certificate shall continue in force only so long as the regular attendance of said minor at the evening school is endorsed weekly by a teacher thereof.

SECTION 5. This act shall take effect on the first day of August in the year nineteen hundred and ten. [*Approved March 19, 1910.*

SANITARY PROVISIONS FOR FACTORIES AND WORKSHOPS.

Acts of 1910, Chapter 259.

An Act relative to sanitary provisions for factories and workshops.

Be it enacted, etc., as follows:

Section 1. Section eighty of chapter five hundred and fourteen of the acts of the year nineteen hundred and nine is hereby amended by striking out the words "the inspection department of the district police", in the fourth and fifth lines, and inserting in place thereof the words: — a state inspector of health, — so as to read as follows: — *Section 80.* The owner, lessee or occupant of any premises which are used as described in the preceding section shall make the changes necessary to conform thereto. If such changes are made upon the order of a state inspector of health, by the occupant or lessee of the premises, he may, within thirty days after the completion thereof bring an action against any other person who has an interest in such premises, and may recover such proportion of the expense of making such changes as the court adjudges should justly and equitably be borne by the defendant.

Section 2. Section eighty-two of said chapter five hundred and fourteen is hereby amended by striking out the words "the inspection department of the district police", in the fourth and fifth lines, and inserting in place thereof the words: — a state inspector of health, — so as to read as follows: — *Section 82.* A criminal prosecution shall not be instituted against a person for a violation of the provisions of sections seventy-nine and eighty until four weeks after notice in writing by a state inspector of health, of the changes necessary to be made to comply with the provisions of said sections has been sent by mail or delivered to such person, nor if such changes shall have been made in accordance with such notice. A notice shall be sufficient under the provisions of this section if given to one member of a firm, or to the clerk, cashier, secretary, agent or any other officer who has charge of the business of a corporation, or to its attorney; and in case of a foreign corporation, to the officer who has the charge of such factory or workshop; and such officer shall be personally liable for the amount of any fine if a judgment against the corporation is returned unsatisfied. [*Approved March 22, 1910.*

DISINFECTING OF PREMISES BY BOARDS OF HEALTH.

Acts of 1910, Chapter 269.

An Act relative to the disinfecting of premises by boards of health.

Be it enacted, etc., as follows:

Section forty-nine of chapter seventy-five of the Revised Laws, as amended by chapter two hundred and fifty-one of the acts of the year nineteen hundred and five, and by chapter four hundred and eighty of the acts of the year nineteen hundred and seven, is hereby further amended by adding at the end thereof the words: — But the board of health of a city or town may in its discretion, disinfect or fumigate all such premises as in the opinion of the board have been exposed to any infectious or contagious disease, at the expense of the city or town, and may employ any proper and competent person or corporation for the purpose of such disinfecting or fumigating, — so as to read as follows: — *Section 49.* A householder who knows that a person in his family or house is sick of smallpox, diphtheria, scarlet fever or any other infectious or contagious disease declared by the state board of health to be dangerous to the public health shall forthwith give notice thereof to the board of health of the city or town in which he dwells. Upon the death, recovery or removal of such person, the householder shall disinfect to the satisfaction of the board such rooms of his house and articles therein as, in the opinion of the board, have been exposed to infection or contagion. Should one or both eyes of an infant become inflamed, swollen and red, and show an unnatural discharge at any time within two weeks after its birth, it shall be the duty of the nurse, relative or other attendant having charge of such infant to report in writing within six hours thereafter, to the board of health of the city or town in which the parents of the infant reside, the fact that such inflammation, swelling and redness of the eyes and unnatural discharge exist. On receipt of such report, or of notice of the same symptoms given by a physician as provided by the following section, the board of health shall take such immediate action as it may deem necessary in order that blindness may be prevented. Whoever violates the provisions of this section shall be punished by a fine of not more than one hundred dollars. But the board of health of a city or town may in its discretion, disinfect or fumigate all such premises as in the opinion of the board have been exposed to any infectious or contagious disease, at the expense of the city or town, and may employ any proper and competent person or corporation for the purpose of such disinfecting or fumigating. [*Approved March 22, 1910.*

SALE OF MORPHINE AND OTHER NARCOTIC DRUGS.

Acts of 1910, Chapter 271.

An Act to regulate the sale of morphine and other narcotic drugs.

Be it enacted, etc., as follows:

Section 1. It shall be unlawful for any person to sell, furnish, give away or deliver any opium, morphine, heroin, codeine or preparations thereof, or any salt or compound of the said substances, except upon the written prescription or order of a lawfully authorized practitioner of medicine, dentistry, or veterinary medicine, which prescription shall bear the name of the person giving it. But the provisions of this section shall not apply to sales made by any manufacturer, wholesale or retail druggist to another manufacturer, wholesale or retail druggist; nor to sales made to hospitals, colleges, scientific or public institutions, or to physicians, dentists, or veterinary surgeons; nor to the sale of cough remedies and other domestic and proprietary preparations: *provided,* that such preparations are sold in good faith as medicines, and not for the purpose of evading the provisions of this act; and *provided,* that such preparations do not contain more than two and one half grains of opium, or one third of a grain of morphine, or one fourth of a grain of heroin, or one grain of codeine or their salts in one fluid ounce; or if a solid preparation, in one avoirdupois ounce, excepting liniments and ointments which are prepared for external use only; nor to preparations containing opium or any of its salts, which are sold in good faith, for diarrhœa, cholera or neuralgia; nor to powder of ipecac and opium, commonly known as Dover's powders; nor to compound medicinal tablets, pills, or powders containing not over one twentieth of a grain of morphine, or one twelfth of a grain of heroin or one fourth of a grain of codeine, or any of their salts to each pill, powder or tablet: *provided,* that such preparations are sold in good faith as medicines and not for the purpose of evading the provisions of this act.

Section 2. It shall be unlawful for any practitioner of medicine, dentistry, or veterinary medicine to prescribe for the use of any habitual user of the same, opium, morphine, heroin, codeine, or any salt or compound of the said substances, or any preparation containing any of the said substances or their salts or compounds; nor shall any practitioner of dentistry prescribe any of the said substances for any person not under his treatment in the regular practice of his profession; nor shall any practitioner of veterinary medicines prescribe any of the said substances for the use of any human being: *provided, however,* that the provisions of this section shall not be construed to prevent any lawfully authorized practitioner of medicine from prescribing in good faith for the use of any habitual user of narcotic drugs who is under his professional care such substances as he may deem neces-

sary for his treatment, when such prescriptions are given in good faith and not for the purpose of evading the provisions of this act.

SECTION 3. Whoever violates any provision of this act shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined not less than five dollars nor more than one thousand dollars; or shall be imprisoned in the house of correction or jail for a term not exceeding one year; or shall be punished by both such fine and imprisonment. [*Approved March 22, 1910.*

LAW RELATIVE TO COCAINE.

ACTS OF 1910, CHAPTER 387.

AN ACT RELATIVE TO THE SALE OF COCAINE.

Be it enacted, etc., as follows:

SECTION 1. It shall be unlawful for any person, firm or corporation to manufacture any so-called catarrh powder or catarrh cure, or any patent or proprietary preparation containing cocaine, or any of its salts, or alpha or beta eucaine, or any of their salts, or any synthetic substitute for them.

SECTION 2. It shall be unlawful for any person, firm or corporation to sell or to expose or offer for sale or to give, deliver or exchange any cocaine, or any alpha or beta eucaine, or any synthetic substitute for them, or any preparation containing the same, or any salts or compounds thereof, except upon the written prescription of a physician, dentist or veterinary surgeon registered under the laws of the state in which he resides; the original of which prescription shall be retained by the druggist filling the same for a period of at least two years and shall not again be filled, except upon the written order of the original prescriber, and shall at all times be open to inspection by the officers of the state board of health, the members of the state board of registration in pharmacy and its authorized agents, and by the police authorities and officers of cities and towns. But no practitioner of veterinary medicine shall prescribe any of the above mentioned substances for the use of any human being.

SECTION 3. It shall be unlawful for any physician or dentist to prescribe, sell or give away any cocaine or its salts, or any alpha or beta eucaine or their salts, or any synthetic substitute for them, or any preparation containing the same, or any salts or compounds thereof, to any person known to such physician or dentist to be an habitual user of those drugs.

SECTION 4. Any manufacturer or jobber of any or all of the articles mentioned in section two of this act, any wholesale druggist, or any registered pharmacist, may sell any article mentioned in said section two to any such manufacturer, jobber, wholesale druggist, or to any pharmacist, physician, veterinarian or dentist, registered under the laws of the state in which he resides, or to any incorporated hospital, but only upon a written order duly

signed by such manufacturer, jobber, wholesale druggist, registered pharmacist, registered physician, registered veterinarian, registered dentist, or the superintendent of such incorporated hospital, which order shall show the article or articles ordered and the date of delivery. The said order shall be kept on file in the laboratory, warehouse, pharmacy or store from which it was filled by the proprietor thereof, or his successor, for a period of not less than two years from the date of delivery, and shall at all times be open to inspection by the officers of the state board of health, the members of the state board of registration in pharmacy and its authorized agents, and by the police authorities and officers of cities and towns; and such order shall not contain any articles not mentioned in section two of this act.

Section 5. Whoever violates any provision of the foregoing sections shall be punished by a fine of not less than fifty nor more than one thousand dollars, or by imprisonment for not more than one year in a county jail or house of correction, or by both such fine and imprisonment.

Section 6. Whoever, not being a registered physician, registered dentist, or registered veterinary surgeon, or manufacturer or wholesale or retail dealer in drugs shall have in his or her possession any cocaine, alpha or beta eucaine, or any synthetic substitute for them, or any preparation containing the same, or any salts or compounds thereof, except by reason of a prescription of a registered physician, registered dentist or registered veterinary surgeon, shall be guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not more than one hundred dollars or by imprisonment of not more than six months, or by both such fine and imprisonment. The provisions of this section shall not apply to any person, firm or corporation while transporting any of the above mentioned articles from or to any manufacturer or jobber, wholesale druggist, registered pharmacist, registered physician, registered veterinarian, registered dentist or incorporated hospital or to persons who may have the above mentioned articles in their possession in connection with the enforcement of the provisions of this act or with the trial of cases arising thereunder.

Section 7. If a person makes complaint under oath to a police, district or municipal court, or to a trial justice or justice of the peace authorized to issue warrants in criminal cases, that he has reason to believe or does believe that cocaine or alpha or beta eucaine, or any synthetic substitute for them, or any preparation containing the same, or any salts or compounds thereof are kept or deposited by a person named therein, in a store, shop, warehouse, building, vehicle, steamboat, vessel or place, other than by a manufacturer or jobber, wholesale druggist, registered pharmacist, registered physician, registered veterinarian, registered dentist, employees of incorporated hospitals or those who are entitled by law to have possession of any of the above mentioned articles, such court or justice, if it appears that there is probable cause to believe that said complaint is true, shall issue a search warrant to a sheriff, deputy sheriff, city marshal, chief of police, deputy marshal,

police officer or constable commanding him to search the premises in which it is alleged that such cocaine, alpha or beta eucaine, or any synthetic substitute for them, or any preparation containing the same, or any salts or compounds thereof are kept or deposited, and to seize such cocaine, alpha or beta eucaine, or any synthetic substitute for them, or any preparation containing the same, or any salts or compounds thereof and securely keep the same until final action, and to arrest the person or persons in whose possession it is found, together with all persons present, and to return the warrant with his doings thereon as soon as may be to a court or trial justice having jurisdiction in the place in which such cocaine, alpha or beta eucaine, or any synthetic substitute for them, or any preparation containing the same, or any salt or compounds thereof are alleged to be kept or deposited.

Section 8. If, after such notice as the court or trial justice shall order, it appears that the cocaine, alpha or beta eucaine, or any synthetic substitute for them, or any preparation containing the same, or any salts or compounds thereof, seized according to the provisions of section seven of this act, was, at the time of making the complaint, in the possession of the person alleged therein in violation of law, the court or trial justice shall render judgment that such and so much of the cocaine, alpha or beta eucaine, or any synthetic substitute for them, or any preparation containing the same, or any salts or compounds thereof, so seized as was so unlawfully kept, shall be forfeited to the commonwealth, and shall, by the authority of the written order of the court or trial justice, be forwarded by common carrier to the state board of health, which upon receipt of the same, shall notify said court or justice thereof. The said board shall sell the same, and after paying the cost of the transportation of the said cocaine, alpha or beta eucaine, or any synthetic substitute for them, or any preparation containing the same, or any salts or compounds thereof, it shall pay over the net proceeds to the treasurer and receiver general.

Section 9. It shall be the duty of the state board of health to cause the prosecution of all persons violating the provisions of this act, but no prosecutions shall be brought against any wholesale or retail druggist for the sale or for the gift or the exchange of any patent or proprietary preparation containing cocaine or alpha or beta eucaine, or any synthetic substitute for them, unless the said board has, prior to such sale, gift or exchange, given public notice in some trade journal that the gift, sale or exchange of the said patent or proprietary preparations, naming them, would be contrary to law.

Section 10. The repeal of a law by this act shall not affect any action, suit or prosecution pending at the time of the repeal for an offence committed or for the recovery of a penalty or forfeiture incurred under any of the laws repealed.

Section 11. Section three and section five of chapter three hundred and eighty-six of the acts of the year nineteen hundred and six, and section four of the same chapter, as amended by section two of chapter three hundred and seventy-five of the acts of the year nineteen hundred and nine, and chapter

three hundred and seven of the acts of the year nineteen hundred and eight, as amended in section two by section one of chapter three hundred and seventy-five of the acts of the year nineteen hundred and nine, are hereby repealed. [*Approved April 13, 1910.*

LAW RELATIVE TO COMMON DRINKING CUP.

Acts of 1910, Chapter 428.

An Act relative to the common drinking cup.

Be it enacted, etc., as follows:

Section 1. In order to prevent the spread of communicable diseases, the state board of health is hereby authorized to prohibit in such public places, vehicles or buildings as it may designate the providing of a common drinking cup, and the board may establish rules and regulations for this purpose.

Section 2. Whoever violates the provisions of this act, or any rule or regulation of the state board of health made under authority hereof, shall be deemed guilty of a misdemeanor and be liable to a fine not exceeding twenty-five dollars for each offence.

Section 3. All acts and parts of acts inconsistent herewith are hereby repealed.

Section 4. This act shall take effect on the first day of October, nineteen hundred and ten. [*Approved April 22, 1910.*

MONTHLY BULLETIN

OF THE

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WEEKLY RETURNS OF DEATHS FROM CITIES AND TOWNS OF MORE THAN 10,000 POPULATION.

WEEK ENDING APRIL 2, 1910.

CITIES AND TOWNS.	Population[1] Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	290	66	103	51	29	3	–	5
Worcester,	136,476	53	19	17	8	3	1	–	1
Fall River,	106,486	42	19	19	7	2	–	–	–
Cambridge,	102,112	31	7	15	10	4	–	–	–
Lowell,	96,380	54	19	26	21	2	–	–	1
New Bedford,	85,516	34	16	12	11	–	–	–	–
Lynn,	84,623	23	5	6	6	–	–	–	–
Springfield,	84,237	37	7	19	10	3	–	–	–
Lawrence,	78,000	36	15	21	15	1	1	2	2
Somerville,	76,049	35	8	18	12	3	–	–	–
Brockton,	55,039	16	5	9	5	2	–	–	–
Holyoke,	53,590	29	11	7	4	–	–	1	–
Malden,	41,941	10	1	3	2	–	–	–	–
Chelsea,	40,080	17	3	5	4	–	–	–	–
Newton,	39,642	11	1	3	2	1	–	–	–
Salem,	39,019	18	5	5	4	1	–	–	–
Haverhill,	38,362	19	3	11	7	1	1	–	–
Fitchburg,	34,263	7	3	3	1	1	–	1	–
Everett,	33,597	12	3	4	2	1	–	–	–
Quincy,	31,937	14	3	5	4	–	–	–	–
Taunton,	30,967	14	4	8	5	2	–	–	–
Waltham,	28,761	12	1	3	1	1	–	–	–
Pittsfield,	27,932	13	3	1	1	–	–	–	–
Brookline,	26,674	17	2	4	3	1	–	–	–
Gloucester,	26,011	9	1	1	–	–	–	–	–
North Adams,	22,150	9	2	4	1	1	–	1	–
Northampton,	21,075	11	1	–	–	–	–	–	–
Chicopee,	21,049	5	0	1	1	–	–	–	–
Medford,	20,921	4	2	2	–	–	–	–	–
Beverly,	16,386	6	1	2	1	1	–	–	–
Leominster,	16,030	7	1	1	–	1	–	–	–
Hyde Park,	15,609	9	1	3	3	–	–	–	–
Melrose,	15,459	6	1	3	1	2	–	–	–
Newburyport,	14,834	6	–	2	2	–	–	–	–
Revere,	14,820	4	1	1	1	–	–	–	–
Westfield,	14,750	8	1	5	3	2	–	–	–
Woburn,	14,522	7	2	3	1	1	1	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	0	–	–	–	–	–	–	–
Attleborough,	13,913	2	0	1	–	1	–	–	–
Adams,	13,685	4	1	–	–	–	–	–	–
Clinton,	13,105	5	2	2	2	–	–	–	–
Gardner,	13,066	6	2	–	–	–	–	–	–
Milford,	12,722	10	2	3	3	–	–	–	–
Watertown,	12,676	2	0	1	–	1	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	8	2	1	1	–	–	–	–
Weymouth,	11,798	3	–	–	–	–	–	–	–
Framingham,	11,749	5	1	2	–	1	–	–	–
Wakefield,	11,124	4	–	1	–	1	–	–	–
Webster,	11,109	3	–	1	–	1	–	–	–
Arlington,	10,520	1	–	–	–	–	–	–	–
Greenfield,	10,140	2	1	1	1	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,401,701	990	254	368	227	71	7	5	9

[1] The populations were estimated upon the rate of growth from 1900 to 1905. Those of Taunton, Gloucester, North Adams and Clinton were allowed to stand as in 1905, having shown no increase during the five-year period. The gain in the population of Lowell is due to the annexation of a part of the town of Tewksbury. The population of Lawrence by the census of 1905 was 70,050, but, owing to the building of the new Wood and Arlington mills, an increase of about 8,000 is estimated by the Lawrence Board of Health, or 78,000.

WEEK ENDING APRIL 9, 1910.

CITIES AND TOWNS.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM—					
				Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	275	59	98	51	24	4	–	1
Worcester,	136,476	46	5	18	14	1	–	–	–
Fall River,	106,486	42	19	12	9	2	–	–	–
Cambridge,	102,112	42	10	18	14	3	–	–	–
Lowell,	96,380	32	10	13	9	1	–	–	–
New Bedford,	85,516	43	13	18	14	1	1	–	–
Lynn,	84,623	23	6	10	5	3	–	–	–
Springfield,	84,237	38	7	11	7	1	–	–	–
Lawrence,	78,000	26	8	13	9	1	–	1	–
Somerville,	76,049	17	1	6	6	–	–	–	–
Brockton,	55,039	21	2	7	6	1	–	–	–
Holyoke,	53,590	21	9	11	3	3	2	–	–
Malden,	41,941	11	3	4	1	1	–	–	–
Chelsea,	40,080	16	5	6	4	–	1	–	–
Newton,	39,642	10	4	2	2	–	–	–	–
Salem,	39,019	12	1	2	2	–	–	–	–
Haverhill,	38,362	18	3	7	4	–	–	–	–
Fitchburg,	34,263	11	2	1	1	–	–	–	–
Everett,	33,597	9	3	1	1	–	–	–	–
Quincy,	31,937	8	3	–	–	–	–	–	–
Taunton,	30,967	17	6	5	5	–	–	–	–
Waltham,	28,761	12	7	3	3	–	–	–	–
Pittsfield,	27,932	7	1	–	–	–	–	–	–
Brookline,	26,674	9	1	1	1	–	–	–	–
Gloucester,	26,011	8	–	2	–	2	–	–	–
North Adams,	22,150	8	1	5	4	1	–	–	–
Northampton,	21,075	12	1	5	4	–	–	–	–
Chicopee,	21,049	9	4	2	1	1	–	–	–
Medford,	20,921	3	–	2	–	2	–	–	–
Beverly,	16,386	6	–	2	1	1	–	–	–
Leominster,	16,030	9	1	2	–	1	–	–	–
Hyde Park,	15,609	6	3	1	–	–	–	–	–
Melrose,	15,459	4	0	2	1	1	–	–	–
Newburyport,	14,834	3	–	1	–	1	–	–	–
Revere,	14,820	4	1	1	–	1	–	–	–
Westfield,	14,750	6	1	3	2	1	–	–	–
Woburn,	14,522	5	1	–	–	–	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	1	0	–	–	–	–	–	–
Attleborough,	13,913	2	0	–	–	–	–	–	–
Adams,	13,685	2	–	1	–	1	–	–	–
Clinton,	13,105	3	1	–	–	–	–	–	–
Gardner,	13,066	3	1	1	1	–	–	–	–
Milford,	12,722	2	0	1	1	–	–	–	–
Watertown,	12,676	5	0	2	1	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	5	4	2	1	–	–	–	–
Weymouth,	11,798	3	–	–	–	–	–	–	–
Framingham,	11,749	7	0	3	2	1	–	–	–
Wakefield,	11,124	4	–	2	1	1	–	–	–
Webster,	11,109	1	–	1	1	–	–	–	–
Arlington,	10,520	6	1	2	2	–	–	–	–
Greenfield,	10,140	4	–	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,401,701	897	208	310	194	57	8	1	1

Week ending April 16, 1910.

Cities and Towns.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	Deaths from—					
				Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	238	54	103	36	31	3	–	2
Worcester,	136,476	62	16	21	13	6	–	–	–
Fall River,	106,486	43	20	9	3	3	1	–	–
Cambridge,	102,112	32	6	22	8	11	–	2	–
Lowell,	96,380	45	16	19	11	4	–	–	1
New Bedford,	85,516	34	17	10	5	3	1	1	–
Lynn,	84,623	22	5	9	7	2	–	–	–
Springfield,	84,237	12	2	4	2	1	–	–	–
Lawrence,	78,000	26	11	9	5	1	–	–	1
Somerville,	76,049	26	3	9	4	3	–	–	–
Brockton,	55,039	19	7	7	4	–	–	–	–
Holyoke,	53,590	30	11	17	10	2	1	–	1
Malden,	41,941	12	2	2	–	–	1	–	–
Chelsea,	40,080	11	5	8	7	1	–	–	–
Newton,	39,642	13	2	2	1	1	–	–	–
Salem,	39,019	14	2	4	1	–	–	–	–
Haverhill,	38,362	18	4	9	4	5	–	–	–
Fitchburg,	34,263	12	4	3	1	1	1	–	–
Everett,	33,597	6	1	–	–	–	–	–	–
Quincy,	31,937	8	1	4	3	1	–	–	–
Taunton,	30,967	16	5	8	6	–	–	–	–
Waltham,	28,761	9	1	2	1	1	–	–	–
Pittsfield,	27,932	4	–	1	1	–	–	–	–
Brookline,	26,674	6	0	1	1	–	–	–	–
Gloucester,	26,011	7	2	–	–	–	–	–	–
North Adams,	22,150	12	–	3	1	1	–	–	–
Northampton,	21,075	3	–	–	–	–	–	–	–
Chicopee,	21,049	4	3	2	2	–	–	–	–
Medford,	20,921	4	–	2	2	–	–	–	–
Beverly,	16,386	4	2	1	1	–	–	–	–
Leominster,	16,030	3	–	1	–	1	–	–	–
Hyde Park,	15,609	5	0	2	1	1	–	–	–
Melrose,	15,459	3	1	1	1	–	–	–	–
Newburyport,	14,834	7	2	4	2	–	–	–	1
Revere,	14,820	3	1	–	–	–	–	–	–
Westfield,	14,750	6	–	2	1	1	–	–	–
Woburn,	14,522	3	1	1	1	–	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	4	1	2	–	1	–	–	–
Attleborough,	13,913	1	0	–	–	–	–	–	–
Adams,	13,685	2	2	–	–	–	–	–	–
Clinton,	13,105	3	1	–	–	–	–	–	–
Gardner,	13,066	1	0	–	–	–	–	–	–
Milford,	12,722	9	0	5	3	1	–	–	–
Watertown,	12,676	1	0	1	–	1	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	0	–	–	–	–	–	–	–
Weymouth,	11,798	6	–	1	–	–	–	–	–
Framingham,	11,749	5	0	–	–	–	–	–	–
Wakefield,	11,124	4	1	4	3	–	–	–	–
Webster,	11,109	6	2	1	–	–	–	–	1
Arlington,	10,520	3	1	–	–	–	–	–	–
Greenfield,	10,140	3	1	1	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,401,701	830	216	317	152	84	8	3	7

WEEK ENDING APRIL 23, 1910.

CITIES AND TOWNS.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	222	57	91	43	24	3	1	4
Worcester,	136,476	52	21	18	10	3	2	–	1
Fall River,	106,486	43	13	14	5	6	–	–	–
Cambridge,	102,112	31	4	20	6	11	–	–	–
Lowell,	96,380	37	13	14	9	2	–	–	–
New Bedford,	85,516	35	9	12	4	3	1	2	–
Lynn,	84,623	28	8	7	4	2	–	–	–
Springfield,	84,237	19	3	11	6	3	1	–	–
Lawrence,	78,000	37	19	17	9	2	2	1	1
Somerville,	76,049	24	3	5	2	2	–	–	–
Brockton,	55,039	10	4	3	–	1	–	–	–
Holyoke,	53,590	14	7	6	3	1	–	–	–
Malden,	41,941	7	1	5	3	1	–	–	–
Chelsea,	40,080	11	4	5	4	1	–	–	–
Newton,	39,642	6	1	2	2	–	–	–	–
Salem,	39,019	8	1	4	2	1	–	–	–
Haverhill,	38,362	20	8	10	7	1	1	–	–
Fitchburg,	34,263	12	2	3	1	–	–	1	–
Everett,	33,597	2	–	6	–	4	–	2	–
Quincy,	31,937	7	1	2	–	1	–	–	–
Taunton,	30,967	11	3	7	4	2	–	–	–
Waltham,	28,761	7	0	2	–	2	–	–	–
Pittsfield,	27,932	11	1	7	7	–	–	–	–
Brookline,	26,674	13	–	1	1	–	–	–	–
Gloucester,	26,011	6	1	–	–	–	–	–	–
North Adams,	22,150	6	–	–	–	–	–	–	–
Northampton,	21,075	10	–	2	–	2	–	–	–
Chicopee,	21,049	3	0	1	1	–	–	–	–
Medford,	20,921	5	1	2	1	1	–	–	–
Beverly,	16,386	8	1	3	2	1	–	–	–
Leominster,	16,030	3	3	–	–	–	–	–	–
Hyde Park,	15,609	3	1	2	1	–	–	–	–
Melrose,	15,459	3	0	1	1	–	–	–	–
Newburyport,	14,834	11	–	5	4	1	–	–	–
Revere,	14,820	4	2	3	1	1	–	–	–
Westfield,	14,750	4	1	2	–	2	–	–	–
Woburn,	14,522	4	–	–	–	–	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	5	0	–	–	–	–	–	–
Attleborough,	13,913	8	0	4	2	–	–	1	1
Adams,	13,685	4	2	1	–	–	1	–	–
Clinton,	13,105	4	0	–	–	–	–	–	–
Gardner,	13,066	4	0	2	1	–	–	–	–
Milford,	12,722	5	1	4	4	–	–	–	–
Watertown,	12,676	4	3	–	–	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	9	5	3	2	–	–	–	–
Weymouth,	11,798	2	–	–	–	–	–	–	–
Framingham,	11,749	5	0	–	–	–	–	–	–
Wakefield,	11,124	3	–	–	–	–	–	–	–
Webster,	11,109	6	–	1	1	–	–	–	–
Arlington,	10,520	3	–	2	1	–	–	–	–
Greenfield,	10,140	3	–	2	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,401,701	802	204	312	154	81	11	8	7

WEEK ENDING APRIL 30, 1910.

CITIES AND TOWNS.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM—					
				Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	262	59	81	36	21	3	1	1
Worcester,	136,476	30	5	12	8	1	–	–	1
Fall River,	106,486	37	19	14	11	2	–	–	–
Cambridge,	102,112	37	5	21	7	9	–	–	1
Lowell,	96,380	40	13	17	7	5	–	–	–
New Bedford,	85,516	27	12	11	5	4	–	1	–
Lynn,	84,623	22	7	7	4	2	–	1	–
Springfield,	84,237	31	11	12	6	2	1	–	–
Lawrence,	78,000	39	18	12	4	5	2	–	–
Somerville,	76,049	23	7	10	3	–	2	–	1
Brockton,	55,039	17	5	7	4	1	–	–	–
Holyoke,	53,590	24	9	8	4	3	–	–	–
Malden,	41,941	8	2	1	–	–	–	–	–
Chelsea,	40,080	10	4	4	3	–	–	–	–
Newton,	39,642	9	4	2	–	2	–	–	–
Salem,	39,019	10	–	3	2	1	–	–	–
Haverhill,	38,362	18	5	8	7	1	–	–	–
Fitchburg,	34,263	17	5	7	2	2	1	1	–
Everett,	33,597	11	3	2	–	2	–	–	–
Quincy,	31,937	7	3	3	2	1	–	–	–
Taunton,	30,967	16	7	9	5	2	–	–	–
Waltham,	28,761	4	0	–	–	–	–	–	–
Pittsfield,	27,932	4	–	2	2	–	–	–	–
Brookline,	26,674	7	–	–	–	–	–	–	–
Gloucester,	26,011	8	–	–	–	–	–	–	–
North Adams,	22,150	8	1	3	1	–	–	–	–
Northampton,	21,075	5	1	1	–	–	1	–	–
Chicopee,	21,049	7	3	4	3	1	–	–	–
Medford,	20,921	7	2	2	2	–	–	–	–
Beverly,	16,386	9	1	3	1	–	–	–	–
Leominster,	16,030	5	2	1	1	–	–	–	–
Hyde Park,	15,609	4	0	–	–	–	–	–	–
Melrose,	15,459	2	1	2	–	2	–	–	–
Newburyport,	14,834	6	–	1	–	–	–	1	–
Revere,	14,820	4	2	2	1	–	–	–	–
Westfield,	14,750	12	3	4	2	2	–	–	–
Woburn,	14,522	3	0	1	1	–	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	3	0	–	–	–	–	–	–
Attleborough,	13,913	3	0	1	–	–	–	–	–
Adams,	13,685	2	–	1	–	1	–	–	–
Clinton,	13,105	1	0	–	–	–	–	–	–
Gardner,	13,066	2	0	–	–	–	–	–	–
Milford,	12,722	4	1	2	2	–	–	–	–
Watertown,	12,676	3	0	–	–	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	5	2	3	2	–	1	–	–
Weymouth,	11,798	6	1	1	1	–	–	–	–
Framingham,	11,749	2	0	1	1	–	–	–	–
Wakefield,	11,124	3	1	2	1	–	–	–	–
Webster,	11,109	2	–	1	–	–	–	–	–
Arlington,	10,520	4	–	2	2	–	–	–	–
Greenfield,	10,140	2	–	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,401,701	832	224	291	143	72	11	5	4

WEEKLY RETURNS OF DEATHS FROM CERTAIN INFECTIOUS DISEASES.

DEATHS FROM INFECTIOUS DISEASES NOT SPECIFICALLY MENTIONED IN ABOVE TABLES DURING THE WEEKS OF APRIL 2, 9, 16, 23 AND 30, 1910.

DISEASE.	Place.	WEEK ENDING—				
		Apr. 2.	Apr. 9.	Apr. 16.	Apr. 23.	Apr. 30.
Cerebro-spinal meningitis,	Boston,	1	–	1	–	–
	Brockton,	1	–	1	–	1
	Chelsea,	–	–	–	–	1
	Framingham,	1	–	–	–	–
	Gloucester,	1	–	–	–	–
	Haverhill,	1	–	–	–	–
	Holyoke,	–	–	–	–	1
	Lowell,	–	1	–	–	–
	Lynn,	–	1	–	–	–
	New Bedford,	–	–	–	1	–
	Newburyport,	–	–	1	–	–
	North Adams,	–	–	–	–	1
	Quincy,	1	–	–	–	–
	Worcester,	2	2	1	–	2
Scarlet fever,	Boston,	–	2	3	–	–
	Brockton,	–	–	–	1	1
	Fitchburg,	–	–	–	–	1
	Haverhill,	1	–	–	1	–
	Lowell,	2	–	2	1	3
	Lynn,	–	–	–	1	–
	Malden,	–	1	–	1	1
	New Bedford,	–	1	–	–	–
	Quincy,	–	–	–	1	–
	Somerville,	–	–	–	–	1
	Southbridge,	–	1	–	–	–
	Springfield,	2	–	1	1	1
Whooping cough,	Boston,	3	1	–	1	3
	Everett,	1	–	–	–	–
	Greenfield,	–	1	–	–	–
	Haverhill,	–	1	–	–	–
	Lawrence,	–	–	1	–	–
	Salem,	–	–	1	–	–
Erysipelas,	Boston,	1	3	1	3	–
	Fitchburg,	–	–	–	1	–
	Lynn,	–	1	–	–	–
	New Bedford,	1	–	–	–	–
	North Adams,	–	–	1	–	–
	Somerville,	–	–	–	–	1
	Taunton,	1	–	–	–	–
	Worcester,	–	–	1	2	–

DEATHS FROM INFECTIOUS DISEASES, ETC. — *Concluded.*

DISEASE.	Place.	WEEK ENDING —				
		Apr. 2.	Apr. 9.	Apr. 16.	Apr. 23.	Apr. 30.
Tuberculosis other than pulmonary.	Arlington,	–	–	–	1	–
	Boston,	2	3	4	3	6
	Brockton,	1	–	–	–	–
	Cambridge,	1	–	1	1	1
	Greenfield,	–	–	–	2	–
	Haverhill,	–	2	–	–	–
	Leominster,	–	1	–	–	–
	Lowell,	–	1	–	1	2
	Marlborough,	–	–	1	–	–
	Malden,	1	–	1	–	–
	Medford,	1	–	–	–	–
	Revere,	–	–	–	1	1
	Salem,	–	–	2	1	–
	Somerville,	–	–	–	1	1
	Southbridge,	–	–	–	1	–
	Taunton,	–	–	1	–	–
	Wakefield,	–	–	–	–	1
	Weymouth,	–	–	1	–	–
	Worcester,	2	1	–	–	–
Influenza,	Attleborough,	–	–	–	–	1
	Beverly,	–	–	–	–	1
	Boston,	3	3	15	3	4
	Brockton,	–	–	1	–	–
	Cambridge,	–	–	–	–	1
	Chelsea,	1	1	–	–	–
	Gardner,	–	–	–	1	–
	Lawrence,	–	1	–	–	–
	Lowell,	–	1	1	–	–
	Medford,	1	–	–	–	–
	Milford,	–	–	1	–	–
	Northampton,	–	1	–	–	–
	Somerville,	1	–	1	–	–
	Springfield,	2	1	–	–	1
	Taunton,	–	–	1	–	1
	Waltham,	1	–	–	–	–
	Webster,	–	–	–	–	1
Meningitis other than cerebro-spinal.	Malden,	–	1	–	–	–
	Hyde Park,	–	1	–	1	–
	Watertown,	–	1	–	–	–
	Wakefield,	–	–	1	–	–

WEEKLY RETURNS OF CASES OF INFECTIOUS DISEASES.

Cases of Infectious Diseases reported during the Weeks of April 2, 9, 16, 23 and 30, 1910.

[Under the provisions of section 52 of chapter 75 of the Revised Laws.]

	Week ending—					
	Apr. 2.	Apr. 9.	Apr. 16.	Apr. 23.	Apr. 30.	Total.
Diphtheria,	113	122	141	162	143	681
Measles,	757	693	708	700	974	3,832
Scarlet fever,	165	143	148	174	829	1,459
Typhoid fever,	31	29	45	37	31	173
Tuberculosis, pulmonary,	171	186	174	178	223	932
Tuberculosis, other than pulmonary,	–	2	1	2	2	7
Cerebro-spinal meningitis,	5	3	4	–	2	14
Meningitis other than cerebro-spinal,	–	2	–	–	1	3
Whooping cough,	35	16	16	26	46	139
Varicella,	47	45	33	45	58	228
Ophthalmia neonatorum,	6	1	2	2	4	15
Anterior poliomyelitis,	1	9	1	–	3	14
Mumps,	5	6	2	3	8	24
Smallpox,	2	1	3	–	–	6
Erysipelas,	1	1	3	1	1	7
Tetanus,	1	–	–	–	3	4
Trachoma,	–	–	–	–	1	1
Actinomycosis,	1	–	–	–	–	1
Anthrax,	–	1	–	–	–	1

MONTHLY REPORT ON INSPECTION OF FOOD AND DRUGS.

The following summary presents the results of the examination of food and drugs made by the State Board of Health during the month of April, 1910: —

Articles examined.	Number found to be of Good Quality.	Number adulterated or varying from the Legal Standard.	Total.	Articles examined.	Number found to be of Good Quality.	Number adulterated or varying from the Legal Standard.	Total.
Butter,	2	2	4	Meat products: —			
Canned fruit and vegetables,	3	–	3	Canned meat,	1	–	1
Cheese,	2	–	2	Hamburg steak,	2	1	3
Cocoa,	4	–	4	Sausages,	7	9	16
Cream,	7	–	7	Milk,	328	96	424
Cream of tartar,	1	–	1	Non-alcoholic drinks,	1	–	1
Dried fruit,	–	1	1	Olive oil,	16	8	24
Drugs,	37	13	50	Peanut butter,	1	–	1
Flavoring extracts,	10	1	11	Rye meal,	1	–	1
Grape juice,	1	–	1	Salad dressing,	1	–	1
Honey,	1	–	1	Smoked fish,	1	–	1
Horse-radish,	1	–	1	Spice,	1	–	1
Jams and jellies,	5	–	5	Table sauce,	3	–	3
Lard,	6	7	13	Vinegar,	13	–	13
Lime juice,	1	–	1	Total,	475	138	613
Maple sugar,	8	–	8				
Maple syrup,	10	–	10				

The samples of drugs found to be adulterated were: spirit of anise, spirit of camphor, spirit of peppermint and a proprietary medicine.

The cities and towns in which samples were collected were: Attleborough, Boston, Cambridge, Chelsea, Chicopee, Dalton, Dedham, Easton, Everett, Fitchburg, Hardwick, Hingham, Kingston, Lawrence, Lee, Leominster, Lowell, Lynn, Malden, New Bedford, Norton, Pittsfield, Plymouth, Reading, Richmond, South Hadley, Stow, Springfield, Taunton, Ware, Wakefield, Westborough, Westfield, West Springfield and Winchester.

PROSECUTIONS FOR VIOLATIONS OF THE LAW RELATING TO FOOD AND DRUGS.

Fifty-two convictions were secured during the month of April, 1910, for selling adulterated food and drugs, as follows: —

No.	Name of Defendant.	Place.	Character of Article sold.
1	Robert Field, manager for New York butter store.	Chicopee,	Butter (oleomargarine).
2	Arthur J. Hughes,	New Bedford,	Butter (oleomargarine).[1]
3	Arthur J. Hughes,	New Bedford,	Hamburg steak.[1,2]
4	Gustave A. Yungbeal,	Lawrence,	Hamburg steak.
5	Alfred G. Alley,	New Bedford,	Lard (compound).
6	Apostol Basdekis,	Chicopee,	Lard (compound).
7	Philip Belle-Isle,	Chicopee Falls,	Lard (compound).
8	Herbert W. Brightman,	New Bedford,	Lard (compound).
9	Joseph Bolane,	New Bedford,	Lard (compound).
10	Josef Cylusnik,	Chicopee,	Lard (compound).
11	Alexander Donaghy,	New Bedford,	Lard (compound).
12	Alexander Donaghy,	New Bedford,	Lard (compound).
13	James Dillon,	Springfield,	Lard (compound).
14	Patrick Fallon,	Springfield,	Lard (compound).
15	William Fanning,	New Bedford,	Lard (compound).
16	Patrick J. Flynn,	New Bedford,	Lard (compound).
17	Oscar Fricker,	New Bedford,	Lard (compound).
18	William F. Houstin,	New Bedford,	Lard (compound).
19	Arthur J. Hughes,	New Bedford,	Lard (compound).
20	John F. Hughes,	Springfield,	Lard (compound).
21	Napoleon Jette,	New Bedford,	Lard (compound).
22	Chas. E. Jennings,	New Bedford,	Lard (compound).
23	Stani Kivialkoroski,	New Bedford,	Lard (compound).
24	Bathazar Kojoyar,	Lawrence,	Lard (compound).
25	Mates Kranzler,	New Bedford,	Lard (compound).
26	Alexander Lanezzti,	Springfield,	Lard (compound).
27	Joseph Lapolle,	New Bedford,	Lard (compound).
28	Joseph Pessolana,	Springfield,	Lard (compound).
29	Philip Phoenix,	New Bedford,	Lard (compound).
30	Arthur E. Robbins,	New Bedford,	Lard (compound).
31	Daniel Robinson,	New Bedford,	Lard (compound).
32	John Woodland,	New Bedford,	Lard (compound).
33	John F. Zajcek,	Lawrence,	Lard (compound).
34	Modeste Lamontague,	Lawrence,	Maple sugar (80 per cent. cane sugar).
35	Clarence H. Cutler,	Lexington,	Milk (skimmed).
36	Thomas Lindsey,	Watertown,	Milk (total solids, 11.40).[1,3]
37	Frank D. Taib,	Chicopee,	Milk (total solids, 11.90).
38	Emma F. Whitney,	Watertown,	Milk (total solids, 11.20).
39	S. Westley Young,	Lawrence,	Milk (total solids, 11.92).
40	S. Westley Young,	Lawrence,	Milk (total solids, 11.26)(skimmed).
41	Alexander Lanezzti,	Springfield,	Olive oil.[4]
42	Antonio Previte,	Boston,	Olive oil.[4]
43	Arthur J. Hughes,	New Bedford,	Sausages.[4]
44	James Smith,	Lowell,	Sausages.[4]
45	Arthur J. Stewart,	Springfield,	Sausages.[4]
46	Chas. L. Thrasher,	Springfield,	Sausages.[4]
47	Forrest E. Beal,	Lowell,	Spirit of anise.[1]
48	Pierre N. Burnell,	Lowell,	Spirit of anise.[1]
49	Azro W. Dows,	Lowell,	Spirit of anise.[1]
50	Joseph I. Guimond,	Chicopee,	Spirit of anise.
51	Chas. H. King,	Chicopee,	Spirit of anise.[1]
52	Frank E. McNabb,	Lowell,	Spirit of anise.[1]

[1] Appealed.
[2] Contained sulphurous acid.
[3] Watered.
[4] Contained cereal.

Fines imposed, $782.

LIST OF ADULTERATED OR IMPROPERLY LABELLED FOODS, ETC., FOR APRIL, 1910.

Number of Sample.	Character of Sample.	Name of Manufacturer, Wholesaler or Producer.	Results of Analyses.
11829	"Universal" brand olive oil.	Frank Corrao, New York, ...	Improperly labelled; percentage of ingredients not stated.
4305 R	Spirit of anise, . .	Malden Pharmacy, North Cambridge, Mass., . . .	Not U. S. P. strength; contains only a trace of anise oil.
4570 N	Milk, ...	Charles Unietres, Old Furnace, Mass., . . .	Total solids, 11.62 per cent.; fat, 2.90 per cent.; proteids, 3.20 per cent.; skimmed milk.
4574 N			Total solids, 10.57 per cent.; fat, 2.20 per cent.; proteids, 2.61 per cent.; skimmed milk.
4576 N			Total solids, 10.99 per cent.; fat, 2.45 per cent.; proteids, 2.80 per cent.; skimmed milk.
4578 N			Total solids, 10.63 per cent.; fat, 2.50 per cent.; proteids, 2.67 per cent.; skimmed milk.
4580 N			Total solids, 11.12 per cent.; fat, 2.55 per cent.; proteids, 2.81 per cent.; skimmed milk.
4586 N			Total solids, 11.12 per cent.; fat, 2.50 per cent.; proteids, 3.00 per cent.; skimmed milk.
11862	Milk, ...	A. J. Rockwood, Everett, Mass., ...	Total solids, 11.90 per cent.; fat, 2.70 per cent.; proteids, 3.39 per cent.; skimmed milk.
11878	Milk, ...	M. Fagan, Easton, Mass., ...	Total solids, 10.25 per cent.; fat, 2.75 per cent.; contained added water.
11879			Total solids, 11.61 per cent.; fat, 4.35 per cent.; contained added water.
11880			Total solids, 10.58 per cent.; fat, 2.80 per cent.; contained added water.
11881			Total solids, 9.94 per cent.; fat, 2.55 per cent.; contained added water.
q 4711	Milk, ...	M. J. Collins, Lynn, Mass., ...	Total solids, 7.82 per cent.; fat, 2.05 per cent.; contained added water.
q 4712	Milk, ...	M. Carvellas, Lynn, Mass., ...	Total solids, 11.29 per cent.; fat, 2.30 per cent.; proteids, 3.18 per cent.; skimmed milk.

Number of Sample.	Character of Sample.	Name of Manufacturer, Wholesaler or Producer.	Results of Analyses.
q 4734	Milk,	Foster B. Phelps, East Princeton, Mass.,	Total solids, 10.40 per cent.; fat, 2.00 per cent.; proteids, 2.69 per cent.; skimmed milk.
q 4737			Total solids, 10.70 per cent.; fat, 2.20 per cent.; proteids, 2.77 per cent.; skimmed milk.
q 4733			Total solids, 11.12 per cent.; fat, 2.50 per cent.; proteids, 2.86 per cent.; skimmed milk.
q 4736			Total solids, 10.60 per cent.; fat, 2.30 per cent.; proteids, 3.08 per cent.; skimmed milk.
4417 R	Milk,	Harvey S. Smith, Pittsfield, Mass.,	Total solids, 11.00 per cent.; fat, 3.50 per cent.; contained added water.
4419 R			Total solids, 11.78 per cent.; fat, 4.25 per cent.; contained added water.
11979	Milk,	Cloverdale Creamery, Malden, Mass.,	Total solids, 11.20 per cent.; fat, 2.50 per cent.; proteids, 3.07 per cent.; skimmed milk.
12013	Milk,	C. Russell, Lawrence, Mass.,	Total solids, 11.24 per cent.; fat, 2.45 per cent.; proteids, 3.12 per cent.; skimmed milk.
12014	Milk,	A. Gengias, Lawrence, Mass.,	Total solids, 11.40 per cent.; fat, 2.60 per cent.; proteids, 3.10 per cent.; skimmed milk.

INSPECTION OF DAIRIES.

During the month of April, 1910, 142 dairies were examined in the following places: —

Place.	Number examined.	Number found to present no Objectionable Features.	Per Cent.	Number concerning which Letters were sent.	Per Cent.
Leominster,	–	–	–	–	–
Second inspection,	50	37	74.00	13	26.00
Marshfield,	4	4	100 00	–	–
Second inspection,	10	9	90.00	1	10.00
Medfield,	35	13	37 14	22	62.86
Methuen,	1	1	100.00	–	–
Natick,	5	5	100 00	–	–
Second inspection,	14	10	71.43	4	28.57
Scituate,	7	6	85.71	1	14.29
Second inspection,	5	4	80.00	1	20 00
Third inspection,	2	1	50.00	1	50.00
Wellesley,	9	7	77.78	2	22.22

Total number of dairies examined,	142
Number found to be free from objectionable conditions,	97
Number concerning which letters were sent,	45
Total number of conditions to which attention was called,	133
Percentage of dairies which passed inspection,	68.31

In addition to the above, 39 dairies were visited at which the sale of milk had been discontinued.

The names of the owners of the dairies found to be worthy of commendation follow: —

Leominster.

Abbot, Dr. G.*†
Adams, E. F.*
Blood, Charles*†
Bowman, F. W.*†
Boyden, W. H.*†
Bunker, George*
Buss, F. E.*†
Carter, E. E.*†
Carter, Fred*
Coleman, Joseph*†
Divol, Hollis*
Fuller, Horace*†
Gates, Charles A.*
Hawes, J. S.*†
Hobbs, Stephen*†
Johnson, John H.*†
Kingsbury, C. J.*†
Ledingham, George*
Leominster Town Farm*
Lewis, L. W.*
Nutting, William*
Ordway, John*
Peirce, E. T.*†
Powers, Ezra W.*†
Richard, Paul*
Robbins, T. L.*†
Sawin, J. F.*
Severance, E.*†
Siggins, James S.*
Smith, A. A.*†
Smith, Charles*
Spencer, George*
Stone, Charles N.*
Thayer, E. W.*†
Welch, A. O.*†
Wheeler, D. E.*
Willard, John*

Marshfield.

Ames, Raymond*
Belanger, Victor
Bryant, Bradley*
Flavill, J. H.
Hatch, F. W.
Kent, Herman*†
Osborn, Augustus*†
Osborn, Lucius*†
Rand, Fred
Searvens, William*†
Thomas, Huntley L.*†
Walker, Ephram H.*†
Williamson, Charles H.*†

* Second inspection. † Reported favorably on first inspection.

Medfield.

Bartlett, J. C.
Brooks, John
Curtis, Joseph W.
Dunn, Arthur G.
Hardy Bros.
Kimball, B. F.
Mason, Alman
Medfield Town Farm
Morse, Frank
Ogilvie, Alexander
Shumway, A. C.
Waterman, George L.
Wood, H. W.

Methuen.

Miller, Fred W.*†

Natick.

Bolser, Theodore*
Brown, L. Alvin*†
Burks, E. W.
Cummings, F. C.
Favor, Richard
Hammond, Edward*
Hopewell, John
Lyford, W. C.*
Natick Town Farm*
Patten, W. S.*†
Stillman, C. S.*†
Thorp, Amasa*
Watts, Samuel*
Whittemore, Charles*†
Wigott Bros.

Scituate.

Andrews, Charles F.
Bradford, J. E.*†
Brown, William*†
Curtis, A. B.*†
Finnie, Charles G.*
Fisher, Ellen A.
Herbert, Pierce W.
Jackson, Henry F.
Lawson, Thomas W.‡
Merritt, Mrs. Henrietta
Perkins, Charles E.

Wellesley.

Burnett, W. J.
Gleason, P. J.
Kilman, George
McLean, William
Rice, Charles
Smith, Walter
Sweetser, G. A.

INSECTS AS CARRIERS OF DISEASE.[1]

By Theobald Smith, M.D., LL.D., *George Fabyan Professor of Comparative Pathology in the Medical School of Harvard University and Pathologist of the Massachusetts State Board of Health.*

The two decades just past have been prolific in discoveries concerning the part played by insects and related lower forms in transmitting human and animal infections. These discoveries have made it plain that all lower forms which live upon man and higher animals as parasites may act as go-betweens in the transportation of micro-organisms of disease. These parasites are known as ecto-parasites because they live upon the skin. They are either temporary or permanent parasites, according to their habits. Mosquitoes are temporary parasites, for they delay upon us only long enough to get a good meal of blood. Certain ticks, on the other hand, spend all but their earliest and last days attached to their host. Between these extremes there are known parasites spending more

* Second inspection. † Reported favorably on first inspection. ‡ Third inspection.

[1] Illustrated lecture, delivered April, 1908, in a public course on sanitary science, in the medical department of Columbia University, New York City.

or less of their life period attached to the host. Thus bed bugs and fleas are temporary, whereas lice are permanent parasites.

This intimate relationship between host and parasite, whereby the latter puts itself from time to time into direct communication with the bloodstream of the former, has been seized upon by a third group of living beings for their immediate advantage. Micro-organisms which were originally parasites of either host or insect found it to their advantage to pass from one to the other during the act of blood-drawing, and thus establish themselves now in the larger host, now in the smaller. Through unknown periods of time a more or less perfect parasitism has thus been developed between the micro-organism on the one hand and the two hosts on the other. The former passes certain definite periods of its life in one host and then awaits the opportunity for passing the remainder in the other.

This brief description suggests to us the potential danger of all blood-sucking ecto-parasites, for there may develop new infections through this relationship. Diseases may be carried to distant countries, provided the machinery for their transmission exists there or survives after being carried thither.

Fortunately for the victim of these diseases, the triple relationship described is absolutely essential for the perpetuation of the disease. Without the micro-organism the blood-sucking insect falls to the level of a mere annoyance. Without the latter the micro-organism cannot be conveyed from one patient to another. It must perish with its last host. Every link in the chain of causation must be perfect, or else the disease itself dies out. As a result of the evolution of this complex machinery, the diseases caused by the micro-organisms thus transmitted are more or less specific. The specificity may be due either to the fact that the micro-organism cannot thrive in the tissues of other hosts, or to the fact that the insect carrier refuses to bite other than its own host. Thus malaria and yellow fever cannot be transmitted to the lower animals artificially. Certain other insect-borne diseases, like the affections due to trypanosomes, may be induced in other species by inoculation. The first group of micro-organisms is highly specialized; the second is not.

The carriers belonging to the invertebrates are not all insects in the zoölogical sense. Some belong to a lower class, the Arachnoidea. It is, however, common to group together for convenience the diseases transmitted both by insects and their near relatives as insect-borne. To begin with the lower class, the so-called ticks and mites, we are confronted by a type of ecto-parasite which is steadily growing in importance, although twenty years ago it was regarded as of no significance whatever. Ticks are compactly-built arachnids attaining the size, when full grown, of a

bean of medium proportions. As their name indicates, the adults are wingless, and differ from true insects among other things in having four pairs of legs. Their mouth parts are modified for the piercing of the skin, for firm attachment and for drawing blood.

Ticks pass through various stages of development, from the egg to the adult or sexually mature individual. After escape from the egg, they are six-legged and are known as larvæ. This stage is followed by a casting off of the skin, or a moult, and the eight-legged or nymphal stage appears. This in turn is succeeded by another moult, which ushers in the mature or sexually ripe stage. The length of these stages varies among different species and is quite dependent upon temperature. Species of ticks also differ among one another in their relation to the host during development. Some remain attached to the skin of the host during their entire cycle, others leave the host before each moult. In other words their parasitism varies in degree. These differences, as we shall see, impress themselves upon the diseases transmitted and give them certain well-known characteristics.

Among the diseases transmitted by ticks are the African tick fever, or relapsing fever, the Rocky Mountain spotted fever and Texas cattle fever. African tick fever is due to a micro-organism belonging to the spirilla or spiral organisms, closely related if not actually belonging to the group of bacteria. The micro-organism of the Rocky Mountain fever has not yet been recognized. The parasite of Texas cattle fever belongs to a large, closely related group of protozoa, which live within the red corpuscles of various animals. This brief statement suffices to show that the micro-organisms transmitted by ticks differ widely from each other. In fact, they belong to three separate groups of organisms.

The female tick, which transmits Texas cattle fever, lives during its entire life cycle attached to cattle, and only drops off to lay a large number of eggs and die. The micro-organism within the tick passes into the egg and is therefore "inherited" by the next generation. During the development of the embryo tick these parasites finally reach the salivary glands of the young tick, and when it attaches itself to cattle it inoculates or injects the germs received from the mother, or the progeny of the same, into the animal as soon as it has put itself into communication with a blood vessel of the host. This roundabout way is not followed in the other tick diseases because the same tick leaves its host repeatedly, and the parasites it draws out of one host it may inject into another host in a later stage of development. It is, however, claimed that even in African tick fever spirilla do occur in the egg, and hence are handed over to the next generation, although the tick transmitting the disease lives only for a time on its host.

Coming to the insects proper, we find here the mosquito standing first in importance as a carrier of parasites. The form of the mosquito may be regarded as familiar to most persons who are interested in living things. Those who observe more closely have been able to distinguish species by the color markings on the proboscis, legs and wings. I met an observant farmer some years ago who had even recognized the difference between male and female mosquito by the very bushy antennæ possessed by the former. He thought that the male was another species. Aside from this excusable misinterpretation his powers of observation deserve commendation.

The life cycle of the mosquito is somewhat like that of the tick. It passes through certain stages, known as larval and pupal, before the adult stage is reached. It differs, however, essentially from the tick in requiring water for its development. The egg, deposited on the water, speedily sets free the larva. This feeds for a time upon the microscopic fauna and flora of the pool or other stagnant water where it happens to be; then it changes into the pupa, during which period it is active, but does not feed. In the mean time, the adult insect is being perfected within the membranes of the pupa, and after a few days these break, and the winged adult mosquito escapes into the air.

Mosquitoes are but temporary parasites. They insert their proboscis into the skin of man or animal, draw the blood required for the development of the eggs in less than a minute and escape in order to digest their stolen meal at leisure. During this short process of filling their digestive tract with blood, they also draw into it any blood parasites living in the host attacked.

In the case of malaria these undergo, in the mosquito, a complex sexual development which leads eventually to a very large progeny of the parasites originally taken in with the blood. The multiplication goes on in cysts imbedded in the walls of the so-called stomach of the mosquito. When ripe these cysts rupture, and the numerous offspring, shaped like fine crescents, are poured into the body cavity of the mosquito. Thence they find their way into the salivary glands. These organs are provided with a very delicate duct, which extends through the proboscis. When the insect pierces the skin to draw blood, the saliva is ejected into the wound through this duct, and with it the malaria organisms or sporozoites. At the same time the larger tube of the proboscis is serving to conduct the blood into the stomach of the insect.

It is highly probable that in the transmission of yellow fever from person to person the process is similar, but it cannot be verified directly because the micro-organism is evidently too small to be detected with the highest available powers of the microscope.

In addition to these microscopic and ultra-microscopic parasites, the mosquito is capable of transmitting larger organisms, true worms, which produce a tropical disease known as filariasis. The adult worms live in different parts of the body, and cause various diseased conditions, all having for their underlying cause the plugging of lymph vessels and the consequent interference with the flow of lymph. The myriads of young born in the body enter the blood stream. During the day they live in the large organs, notably the lungs. At night, when mosquitoes swarm, they appear in the superficial vessels, whence they are easily pumped out into the mosquito's stomach with the blood. These very minute worms undergo some development in the mosquito, and are then injected into another host when the insect draws blood a second time.

The number of species of mosquitoes described is very large and their distribution covers the greater part of the globe. Fortunately, not all species are transmitters of disease germs. Only a relatively few species of one genus (*Anopheles*) are capable of transmitting malaria. Only one species (*Stegomya calopus*) is known to carry yellow fever. Filariasis is taken care of by still another species. It is safe to say that we have not yet discovered all the possibilities of the mosquito as a disseminator of disease, and the future may bring to light further dangerous resources of this pest.

The group of common flies known as biting flies are also to be regarded as dangerous species, because of their habit of drawing blood from larger animals and man. Notably, certain species of tropical countries, the tsé tsé flies (*Glossina*), have gained an unenviable reputation as slayers of men and animals. One of these species (*Glossina morsitans*) was known to Livingston as a pest dangerous to domestic animals, but the explanation of the danger was first given us by Bruce in 1894, when he discovered that the fly in drawing blood introduces micro-organisms known as trypanosomes. These organisms are but little larger than the largest bacteria, and are small enough to enter the smallest blood vessels. Domestic animals introduced into tropical regions where this disease prevails fall a prey to it, although the native wild animals are immune.

More recently the cause of the sleeping sickness in man has been laid bare as a trypanosome inoculated by another fly (*Glossina palpalis*). In addition to these two species of *Glossina* which are restricted to the tropics, there are other biting flies quite widely distributed over tropical and temperate climates. These are known as horse flies (*Tabanus*) and stable flies (*Stomoxys*). Fortunately they do not attack man, and they do not convey any dangerous diseases in our climate to domestic animals, unless it be anthrax.

There is but one other blood-sucking insect which science has directly

associated with, perhaps, the most dreaded human disease now known, the bubonic plague. The flea, a truly cosmopolitan parasite, is in reality a composite for a number of fleas which differ but little from one another, but which are parasitic upon different hosts. Some of these occasionally attack other hosts, some do not. The rat flea is regarded as the usual transmitter of the plague bacillus because it occasionally attacks man. Just how the infection takes place is not fully understood; but there seems to be no question about the active agency of the rat flea in disseminating the plague. Unlike the insect-borne diseases already described, which are caused by micro-organisms belonging to the protozoa, — the simplest and smallest known animal forms, — the bubonic plague is caused by a bacterium. Organisms of this class may be disseminated and transmitted by various agencies, and the plague bacillus is not, therefore, exclusively dependent upon fleas.

There is one other group of human parasites, quite widely disseminated, the lice, which do not feed upon human blood and which are not definitely known to transmit infections. That they are, however, equipped and potentially able to do so cannot be denied, and sanitarians should regard them as possible sources of danger until the contrary has been proved.

No lecture on insects in their sanitary relations would be complete without some reference to the common house fly. This familiar insect, considered until recently a more or less unavoidable domestic plague, does not stand in any direct biological relation to disease germs, as do the mosquitoes and arachnids already mentioned. It is an accidental agent in disseminating infection because of its habits. Attracted by both human and animal filth as well as human food, it attacks both impartially and moves freely from one to the other. On its exterior, its feet and its proboscis, and in its digestive tract, it carries bacteria from place to place. It inoculates foods with bacteria from excreta and other organic refuse, and, in a suitable incubating temperature, such inoculated bacteria are given opportunity to multiply in milk, on meat, fish and other moist foods. Its intestinal contents are deposited as fly specks upon solid food.

The chief diseases which the house fly may assist in disseminating are those whose microbes are passed out in secretions and excretions, such as diarrhœal diseases, dysentery, typhoid and cholera. With the fly specks may be deposited tubercle bacilli if the flies have access to sputum, which they greedily devour. Dried blood is also a favorite article of food. All these things the house fly may do because it represents simply a tiny mass of filth in transit. How much disease the fly is directly responsible for it is impossible to determine accurately, for it is simply one of a miscellaneous number of agents which may transport filth. Whether we

do or do not hold that some of the crusades against the house fly rest on an exaggerated basis, we may rest assured that every movement for cleanliness which works against the house fly is to be encouraged for other reasons as well.

The dangers of the house fly are like those of the mosquito, due wholly to the adult. The larval forms are not involved. Yet to wage war against both we must attack their nurseries. We are more or less helpless against the winged insect. The house fly lays its hundred or more eggs in a variety of decaying organic matter and domestic waste, but the preferred medium is fresh horse manure. The embryo matures very rapidly, and leaves the shell earliest after about eight hours. The little larvæ or maggots feed upon the offal in which they find themselves, and become slender whitish bodies about half an inch long. They then pupate, *i.e.,* the outer skin dries and forms a case within which the larva becomes transformed into the adult fly. In hot weather the entire development may be completed in ten to fourteen days, but it may be greatly lengthened at lower temperatures.

In discussing the infectious diseases of the larger animals which are transmissible to man, we encountered a difficulty in the great economic and even hygienic value of these animals to the human race. It would do infinite harm to wage a destructive war on these animals because of the existence of these diseases. This difficulty is not encountered in dealing with the noxious insects. We have no evidence at present that the complete annihilation of ticks, mites, mosquitoes, biting flies, bed bugs, fleas and lice would upset the balance of nature and result in harm. The house fly and other flies are in one sense scavengers, in that their larvæ feed upon decaying and putrefying vegetable and animal matter and thus destroy it. But we should attend to the removal of offal ourselves, rather than call in a dangerous agent that does it only partially in any case.

The complete destruction of the blood-sucking parasites is the goal to be aimed for. Though it may never be reached, yet the reduction in numbers and the gradual elimination from definite areas will proportionately reduce the dangers. The extinction of these insects is called for because many of the protozoan parasites inoculated by them survive in the human and animal body an indefinite length of time after recovery. This is true of the micro-organisms of malaria, sleeping sickness, Texas cattle fever and of the tsé tsé fly disease of domestic animals. Since it is impossible to completely rid man and animals of these parasites, the destruction of the transmitting agent is called for to render them harmless. This warfare demands an accurate knowledge of every detail of the life history of these insects, the appearance presented by their

stages of development, their breeding places, their food, the length of the period of development and the resistance of the larval and other stages to various destructive agents. Often a very weak and very inconspicuous link in the chain of development can be easily attacked, and life thereby destroyed or breeding rendered impossible.

The movement aiming at the destruction of mosquitoes is being carried on in this way in many places. The national government is working on the extinction of the cattle tick. Municipalities are beginning to take an interest in the fly nuisance. While the mosquito is being eliminated by dealing with stagnant water, the fly nuisance will slowly disappear with the better management of garbage and other refuse, the closer supervision of city dumps and the strict regulation of horse and cow stables.

The tremendous significance of blood-sucking insects is brought home to us by the attempt of the white man to colonize the tropics. The mosquitoes, the tsé tsé fly and the ticks shadow him until he leaves or dies. The ticks and the other biting flies shadow his horses and cattle which he brings with him and they die. Without health there can be no industry, no activity; without domestic animals, no effective agriculture. Meanwhile, the natives, selected by a weeding-out process of nature through thousands of years, have not only acquired a fair degree of immunity, but they carry in their blood the parasites which the biting insects take out and inject into the white invader. Moralists may be inclined to tell us that nature is here meting out a hardfisted, merciless justice. Scientists tell us that the conquest of the tropics will be a battle royal with nature, and that the new territory will be amply paid for in human strength and human lives.

In the temperate zones, those animal parasites predominant in the tropics lose their supremacy more and more as the climate grows colder. There are, however, enough left whose potency grows with the density of population. Especially the vermin of our houses, which breed in filth, such as rats and mice, lice, bed bugs and fleas, need attention. Warfare upon vermin of every kind will be a prominent issue of the sanitary movement of the future.

LAW RELATIVE TO FOOD AND DRUG INSPECTORS OF THE STATE BOARD OF HEALTH.

Acts of 1910, Chapter 394.

An Act relative to the powers of the food and drug inspectors of the state board of health.

Be it enacted, etc., as follows:

Inspectors of the state board of health, appointed under the provisions of section five of chapter seventy-five of the Revised Laws, shall have, in respect to milk, the power and authority conferred upon milk inspectors of cities and towns. [*Approved April 13, 1910.*

LAW RELATIVE TO PROSECUTIONS UNDER THE FOOD AND DRUG ACTS.

Acts of 1910, Chapter 416.

An Act relative to prosecutions under the laws relative to adulterated drugs and food.

Be it enacted, etc., as follows:

Section 1. No prosecution shall be begun under sections sixteen to twenty-seven, inclusive, of chapter seventy-five of the Revised Laws, for the manufacture, sale or offering for sale of drugs, unless the person purchasing the drug or taking the drug without purchasing shall seal and deliver to the owner or person from whom such drug is purchased or taken a portion of the drug so purchased or taken; and a receipt therefor shall be given to the collector. The drug so purchased or taken shall thereafter be analyzed or tested under the direction of the state board of health for the purpose of determining whether it comes within the provisions of the section above mentioned.

Section 2. If it appears that any provision of said section has been violated, the said board may direct or authorize formal complaint to be made to a court or justice having jurisdiction in such cases; but no evidence of the result of said analysis or test shall be received if the collector refuses or neglects to seal and deliver a portion of the drug purchased or taken as aforesaid to the owner or person from whose possession it is taken. [*Approved April 20, 1910.*

LAW RELATIVE TO INSPECTORS OF MILK.

Acts of 1910, Chapter 457.

An Act relative to inspectors of milk.

Be it enacted, etc., as follows:

Section 1. No person whose business is, in whole or in part, the buying or selling of milk, or who is an officer, agent or employee of any person, partnership or corporation engaged in the sale of milk shall hereafter be appointed or reappointed an inspector of milk.

Section 2. This act shall take effect upon its passage. [*Approved April 27, 1910.*

LAW RELATIVE TO THE SEALING OF PAPER BOTTLES AND JARS.

Acts of 1910, Chapter 462.

An Act relative to the sealing of paper bottles and jars.

Be it enacted, etc., as follows:

Section 1. Paper or fibre bottles and jars which are used for the distribution of milk or cream to consumers, and which hold, when filled to a level with the bottom of the cap or stopple, not less than eight, sixteen, thirty-two, forty-eight or sixty-four ounces, shall be sealed as measures under the provisions of section twenty-one of chapter sixty-two of the Revised Laws, or of chapter three hundred and twenty-three of the acts of the year nineteen hundred and six, or by the manufacturer in the manner provided in section forty-three of chapter sixty-two of the Revised Laws, as amended by chapter five hundred and thirty-one of the acts of the year nineteen hundred and nine, and when so sealed may be used in the manner provided by law for glass milk jars and bottles. Every such bottle or jar shall have plainly stamped upon it by the manufacturers the words: — "Penalty for re-use, twenty-five dollars."

Section 2. Whoever re-uses any such paper or fibre bottle or jar for distributing milk, cream or other liquid used for food, after such bottle or jar has been once used therefor, shall be punished by a fine of not more than twenty-five dollars for each offence. [*Approved April 28, 1910.*

LAW RELATIVE TO DUTIES OF STATE INSPECTORS OF HEALTH AND STATE BOARD OF HEALTH.

Acts of 1910, Chapter 405.

An Act relative to the duties of inspectors of health and to the state board of health.

Be it enacted, etc., as follows:

Section 1. The state inspectors of health, in addition to the duties provided for by chapter five hundred and thirty-seven of the acts of the year nineteen hundred and seven, shall annually make such examination of police station houses, lock-ups and houses of detention as in the opinion of the state board of health may be necessary to ascertain the sanitary condition of such houses and lock-ups.

Section 2. The state board of health shall make rules for police station houses, lock-ups and houses of detention, regarding the care and use of drinking cups and of dishes used for food; the care and use of bedding, and the ventilation of the buildings. Such rules may be general, or may be applicable to a single station house, house of detention or lock-up; and a copy thereof shall be sent by said board to the mayor of every city and to the selectmen of every town to which the rules apply. It shall be the duty of the mayors of cities and the selectmen of towns to which the rules so made apply to see that the rules are enforced.

Section 3. No station house, house of detention or lock-up shall be built hereafter until the state board of health has approved in writing the plans, provisions for lighting, heating and ventilation and the disposal of sewage, and the dimensions and form of construction of the cells.

Section 4. In order to carry out the provisions of this act there may be expended from the treasury of the commonwealth, annually, a sum not exceeding eight hundred dollars in addition to the five thousand dollars authorized by section seven of chapter five hundred and thirty-seven of the acts of the year nineteen hundred and seven.

Section 5. This act shall take effect upon its passage. [*Approved April 16, 1910.*

LAW RELATIVE TO THE ANALYSES OF DRUGS AND POISONS.

Acts of 1910, Chapter 495.

An Act to require the state board of health to make analyses of drugs and poisons in certain cases.

Be it enacted, etc., as follows:

Section 1. The state board of health shall make, free of charge, a chemical analysis of cocaine, alpha or beta eucaine, or any synthetic substitute for them, or any preparation containing the same, or any salt or compound thereof, and of any poison, drug, medicine or chemical, when submitted to it by police authorities or by such incorporated charitable organizations in the commonwealth, as the state board of health shall approve for this purpose: *provided,* that said board is satisfied that the analysis is to be used for the enforcement of law.

Section 2. The said board shall furnish a certificate of the result of the analysis above provided for to said authorities or organizations, and the certificate shall be prima facie evidence of the composition and quality of the materials so analyzed.

Section 3. This act shall take effect upon its passage. [*Approved May 7, 1910.*

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WEEKLY RETURNS OF DEATHS FROM CITIES AND TOWNS OF MORE THAN 10,000 POPULATION.

WEEK ENDING MAY 7, 1910.

CITIES AND TOWNS.	Population [1] Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM — Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	235	53	82	24	28	6	1	4
Worcester,	136,476	39	8	8	2	2	–	–	–
Fall River,	106,486	45	15	19	8	4	1	–	–
Cambridge,	102,112	21	2	11	2	3	–	2	1
Lowell,	96,380	42	20	10	6	2	1	–	–
New Bedford,	85,516	34	12	11	6	2	–	–	–
Lynn,	84,623	22	7	8	4	3	–	1	–
Springfield,	84,237	33	11	10	5	–	3	1	–
Lawrence,	78,000	24	11	10	7	–	1	–	–
Somerville,	76,049	20	5	6	3	–	1	1	–
Brockton,	55,039	15	5	3	1	–	–	–	–
Holyoke,	53,590	21	12	8	4	–	1	–	1
Malden,	41,941	16	4	4	1	1	–	–	–
Chelsea,	40,080	10	3	2	1	–	–	–	–
Newton,	39,642	12	3	2	1	–	–	–	–
Salem,	39,019	15	3	3	–	1	–	1	–
Haverhill,	38,362	9	3	3	3	–	–	–	–
Fitchburg,	34,263	10	2	1	1	–	–	–	–
Everett,	33,597	13	4	1	–	–	–	–	–
Quincy,	31,937	7	–	4	2	2	–	–	–
Taunton,	30,967	17	7	7	3	–	–	1	1
Waltham,	28,761	6	1	1	1	–	–	–	–
Pittsfield,	27,932	8	1	–	–	–	–	–	–
Brookline,	26,674	6	–	–	–	–	–	–	–
Gloucester,	26,011	4	–	–	–	–	–	–	–
North Adams,	22,150	5	–	1	–	1	–	–	–
Northampton,	21,075	10	–	1	1	–	–	–	–
Chicopee,	21,049	8	4	6	2	3	–	–	–
Medford,	20,921	5	2	2	2	–	–	–	–
Beverly,	16,386	6	2	4	–	2	1	–	–
Leominster,	16,030	4	1	–	–	–	–	–	–
Hyde Park,	15,609	4	0	1	–	1	–	–	–
Melrose,	15,459	2	0	1	–	–	–	–	–
Newburyport,	14,834	8	–	1	–	1	–	–	–
Revere,	14,820	5	1	1	–	1	–	–	–
Westfield,	14,750	0	–	–	–	–	–	–	–
Woburn,	14,522	4	3	–	–	–	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	3	0	2	–	1	–	–	1
Attleborough,	13,913	1	–	1	1	–	–	–	–
Adams,	13,685	3	1	1	–	1	–	–	–
Clinton,	13,105	3	–	1	–	1	–	–	–
Gardner,	13,066	2	1	–	–	–	–	–	–
Milford,	12,722	5	1	5	3	–	–	–	–
Watertown,	12,676	4	2	1	–	1	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	3	1	2	1	–	–	–	–
Weymouth,	11,798	4	–	1	1	–	–	–	–
Framingham,	11,749	3	1	–	–	–	–	–	–
Wakefield,	11,124	2	–	1	–	1	–	–	–
Webster,	11,109	3	2	1	1	–	–	–	–
Arlington,	10,520	3	–	2	1	1	–	–	–
Greenfield,	10,140	1	–	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,401,701	785	214	250	100	61	15	8	8

[1] The populations were estimated upon the rate of growth from 1900 to 1905. Those of Taunton, Gloucester, North Adams and Clinton were allowed to stand as in 1905, having shown no increase during the five-year period. The gain in the population of Lowell is due to the annexation of a part of the town of Tewksbury. The population of Lawrence by the census of 1905 was 70,050, but, owing to the building of the new Wood and Arlington mills, an increase of about 8,000 is estimated by the Lawrence Board of Health, or 78,000.

WEEK ENDING MAY 14, 1910.

CITIES AND TOWNS.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	203	50	77	20	24	2	–	9
Worcester,	136,476	39	11	12	6	3	1	–	–
Fall River,	106,486	32	17	20	8	4	–	–	–
Cambridge,	102,112	34	8	18	5	10	1	–	–
Lowell,	96,380	37	13	11	5	3	–	–	–
New Bedford,	85,516	39	16	11	7	2	–	–	–
Lynn,	84,623	21	4	8	5	2	–	–	–
Springfield,	84,237	30	9	11	4	1	–	–	2
Lawrence,	78,000	25	6	8	1	3	1	–	1
Somerville,	76,049	19	5	8	4	2	–	–	1
Brockton,	55,039	18	5	5	3	1	–	–	–
Holyoke,	53,590	19	7	9	5	3	–	–	–
Malden,	41,941	9	4	1	–	–	–	–	–
Chelsea,	40,080	11	4	4	4	–	–	–	–
Newton,	39,642	8	0	1	–	1	–	–	–
Salem,	39,019	13	5	3	2	–	–	–	–
Haverhill,	38,362	20	4	8	5	2	1	–	–
Fitchburg,	34,263	7	2	2	–	–	–	–	–
Everett,	33,597	8	1	1	–	1	–	–	–
Quincy,	31,937	4	2	1	1	–	–	–	–
Taunton,	30,967	16	5	6	3	2	–	1	–
Waltham,	28,761	6	1	1	1	–	–	–	–
Pittsfield,	27,932	13	3	5	2	1	1	1	–
Brookline,	26,674	–	–	–	–	–	–	–	–
Gloucester,	26,011	3	–	–	–	–	–	–	–
North Adams,	22,150	8	4	4	3	–	–	–	–
Northampton,	21,075	4	–	1	–	–	1	–	–
Chicopee,	21,049	8	4	3	2	–	1	–	–
Medford,	20,921	4	–	–	–	–	–	–	–
Beverly,	16,386	5	2	–	–	–	–	–	–
Leominster,	16,030	1	–	–	–	–	–	–	–
Hyde Park,	15,609	5	2	–	–	–	–	–	–
Melrose,	15,459	4	1	–	–	–	–	–	–
Newburyport,	14,834	9	4	4	3	–	–	1	–
Revere,	14,820	3	2	–	–	–	–	–	–
Westfield,	14,730	9	1	2	–	1	1	–	–
Woburn,	14,522	4	0	1	1	–	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	4	1	–	–	–	–	–	–
Attleborough,	13,913	4	1	–	–	–	–	–	–
Adams,	13,685	4	–	–	–	–	–	–	–
Clinton,	13,105	6	0	2	–	1	–	–	–
Gardner,	13,066	0	–	–	–	–	–	–	–
Milford,	12,722	3	1	2	2	–	–	–	–
Watertown,	12,676	2	1	2	1	1	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	3	2	1	–	1	–	–	–
Weymouth,	11,798	6	–	–	–	–	–	–	–
Framingham,	11,749	1	1	–	–	–	–	–	–
Wakefield,	11,124	4	–	3	1	–	–	–	–
Webster,	11,109	2	1	1	1	–	–	–	–
Arlington,	10,520	1	–	–	–	–	–	–	–
Greenfield,	10,140	1	1	–	–	–	–	–	–

Recapitulation.

Total of reporting towns,	2,375,027	739	211	257	105	69	10	3	13

WEEK ENDING MAY 21, 1910.

CITIES AND TOWNS.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	214	47	92	28	35	4	1	8
Worcester,	136,476	47	18	13	10	2	–	–	1
Fall River,	106,486	33	–	24	10	7	–	–	–
Cambridge,	102,112	31	5	8	3	5	–	–	–
Lowell,	96,380	30	8	12	4	4	–	–	–
New Bedford,	85,516	25	6	8	2	3	–	–	–
Lynn,	84,623	20	7	6	4	2	–	–	–
Springfield,	84,237	24	8	4	3	–	–	1	–
Lawrence,	78,000	31	15	9	4	2	–	–	1
Somerville,	76,049	21	8	10	6	–	1	–	–
Brockton,	55,039	9	–	3	2	–	–	–	–
Holyoke,	53,590	10	4	4	3	–	–	–	–
Malden,	41,941	10	1	2	1	–	–	–	–
Chelsea,	40,080	18	2	3	2	1	–	–	–
Newton,	39,642	16	2	2	–	2	–	–	–
Salem,	39,019	17	3	4	1	2	–	–	–
Haverhill,	38,362	17	3	8	4	1	1	1	–
Fitchburg,	34,263	10	1	2	1	1	–	–	–
Everett,	33,597	7	3	3	2	1	–	–	–
Quincy,	31,937	5	1	1	–	1	–	–	–
Taunton,	30,967	21	8	4	4	–	–	–	–
Waltham,	28,761	5	0	–	–	–	–	–	–
Pittsfield,	27,932	7	1	1	–	–	–	–	–
Brookline,	26,674	8	2	1	1	–	–	–	–
Gloucester,	26,011	5	–	–	–	–	–	–	–
North Adams,	22,150	4	2	1	–	–	1	–	–
Northampton,	21,075	2	–	–	–	–	–	–	–
Chicopee,	21,049	9	5	3	2	1	–	–	–
Medford,	20,921	5	–	4	2	1	1	–	–
Beverly,	16,386	2	–	–	–	–	–	–	–
Leominster,	16,030	2	1	–	–	–	–	–	–
Hyde Park,	15,609	5	3	2	–	–	–	–	–
Melrose,	15,459	2	0	–	–	–	–	–	–
Newburyport,	14,834	7	1	3	2	1	–	–	–
Revere,	14,820	2	1	–	–	–	–	–	–
Westfield,	14,750	10	–	5	2	3	–	–	–
Woburn,	14,522	4	0	2	1	1	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	4	2	–	–	–	–	–	–
Attleborough,	13,913	4	1	–	–	–	–	–	–
Adams,	13,685	1	–	–	–	–	–	–	–
Clinton,	13,105	5	2	–	–	–	–	–	–
Gardner,	13,066	3	0	1	1	–	–	–	–
Milford,	12,722	3	0	–	–	–	–	–	–
Watertown,	12,676	2	0	2	1	1	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	3	2	–	–	–	–	–	–
Weymouth,	11,798	6	–	–	–	–	–	–	–
Framingham,	11,749	5	0	1	1	–	–	–	–
Wakefield,	11,124	1	–	1	–	1	–	–	–
Webster,	11,109	5	5	–	–	–	–	–	–
Arlington,	10,520	1	–	–	–	–	–	–	–
Greenfield,	10,140	2	–	–	–	–	–	–	–

Recapitulation.

Total of reporting towns,	2,401,701	740	178	249	107	78	8	3	10

WEEK ENDING MAY 28, 1910.

CITIES AND TOWNS.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	215	58	76	28	23	3	2	3
Worcester,	136,476	27	7	13	8	1	1	–	1
Fall River,	106,486	33	23	15	6	–	3	1	–
Cambridge,	102,112	22	5	9	4	4	–	–	–
Lowell,	96,380	35	16	15	8	1	1	–	1
New Bedford,	85,516	39	17	9	8	1	–	–	–
Lynn,	84,623	21	4	5	2	3	–	–	–
Springfield,	84,237	28	9	10	3	1	1	–	2
Lawrence,	78,000	18	7	11	3	1	1	–	1
Somerville,	76,049	29	8	6	3	1	–	–	–
Brockton,	55,039	11	4	2	1	–	–	–	–
Holyoke,	53,590	26	13	10	4	2	–	–	–
Malden,	41,941	11	1	1	–	–	–	–	–
Chelsea,	40,080	13	1	2	2	–	–	–	–
Newton,	39,642	13	3	1	–	1	–	–	–
Salem,	39,019	12	2	3	1	1	–	–	–
Haverhill,	38,362	8	2	1	–	1	–	–	–
Fitchburg,	34,263	9	3	–	–	–	–	–	–
Everett,	33,597	8	2	–	–	–	–	–	–
Quincy,	31,937	7	3	1	1	–	–	–	–
Taunton,	30,967	11	2	4	2	2	–	–	–
Waltham,	28,761	5	0	–	–	–	–	–	–
Pittsfield,	27,932	6	3	2	2	–	–	–	–
Brookline,	26,674	2	–	1	1	–	–	–	–
Gloucester,	26,011	4	1	0	–	–	–	–	–
North Adams,	22,150	5	2	3	1	1	1	–	–
Northampton,	21,075	10	1	1	–	–	–	–	–
Chicopee,	21,049	7	5	3	2	–	–	–	–
Medford,	20,921	7	1	2	1	–	–	–	–
Beverly,	16,386	7	–	2	1	–	–	–	–
Leominster,	16,030	2	–	–	–	–	–	–	–
Hyde Park,	15,609	5	2	1	–	–	–	–	–
Melrose,	15,459	5	1	–	–	–	–	–	–
Newburyport,	14,834	5	1	3	1	2	–	–	–
Revere,	14,820	4	3	1	1	–	–	–	–
Westfield,	14,750	5	1	3	–	3	–	–	–
Woburn,	14,522	9	3	2	1	–	–	–	1
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	2	0	–	–	–	–	–	–
Attleborough,	13,913	3	2	–	–	–	–	–	–
Adams,	13,685	4	1	–	–	–	–	–	–
Clinton,	13,105	1	–	–	–	–	–	–	–
Gardner,	13,066	9	4	4	3	–	–	–	–
Milford,	12,722	4	0	–	–	–	–	–	–
Watertown,	12,676	5	2	2	2	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	3	1	1	–	–	1	–	–
Weymouth,	11,798	1	–	–	–	–	–	–	–
Framingham,	11,749	7	0	2	1	1	–	–	–
Wakefield,	11,124	2	–	1	–	1	–	–	–
Webster,	11,109	2	1	–	–	–	–	–	–
Arlington,	10,520	2	1	1	–	1	–	–	–
Greenfield,	10,140	–	–	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,391,561	729	226	229	101	52	12	3	9

WEEKLY RETURNS OF DEATHS FROM CERTAIN INFECTIOUS DISEASES.

DEATHS FROM INFECTIOUS DISEASES NOT SPECIFICALLY MENTIONED IN ABOVE TABLES DURING THE WEEKS OF MAY 7, 14, 21 AND 28, 1910.

DISEASE.	Place.	WEEK ENDING—			
		May 7.	May 14.	May 21.	May 28.
Cerebro-spinal meningitis,	Boston,	–	–	1	1
	Cambridge,	1	–	–	–
	Lowell,	–	–	–	1
	Malden,	1	–	–	–
	Melrose,	1	–	–	–
	Milford,	1	–	–	–
	Springfield,	–	1	–	–
	Taunton,	2	–	–	–
	Worcester,	1	1	–	–
Scarlet fever,	Boston,	5	6	–	1
	Brockton,	–	1	–	1
	Cambridge,	–	1	–	1
	Chelsea,	1	–	–	–
	Chicopee,	1	–	–	–
	Everett,	1	–	–	–
	Lowell,	1	2	3	1
	Lynn,	–	1	–	–
	Malden,	1	–	1	–
	New Bedford,	1	1	–	–
	Newton,	1	–	–	–
	Salem,	–	–	1	–
	Springfield,	–	1	–	–
Whooping cough,	Boston,	–	–	1	–
	Holyoke,	–	1	–	–
	Lawrence,	1	–	1	–
	Lowell,	–	1	–	–
	Medford,	–	–	–	1
	Salem,	1	–	–	–
Erysipelas,	Beverly,	1	–	–	1
	Boston,	3	4	–	3
	Clinton,	–	1	–	–
	Fitchburg,	–	2	–	–
	Malden,	–	1	–	–
	New Bedford,	–	–	1	–
	Salem,	–	–	–	1
	Somerville,	–	–	2	2
Tuberculosis other than pulmonary.	Boston,	1	8	4	9
	Brockton,	2	–	1	–
	Cambridge,	1	–	–	–
	Fall River,	1	1	1	1
	Gardner,	–	–	–	1
	Haverhill,	–	–	1	–

DEATHS FROM INFECTIOUS DISEASES, ETC. — *Concluded.*

DISEASE.	Place.	WEEK ENDING—			
		May 7.	May 14.	May 21.	May 28.
Tuberculosis other than pulmonary — *Con.*	Holyoke,	1	–	1	1
	Hyde Park,	–	–	–	1
	Lawrence,	–	1	–	1
	New Bedford,	1	1	–	–
	Northampton,	–	–	–	1
	Pittsfield,	–	–	1	–
	Worcester,	1	–	–	–
	Salem,	–	1	–	–
	Somerville,	–	1	1	–
	Southbridge,	1	–	–	–
	Springfield,	1	–	–	1
	Wakefield,	–	1	–	–
	Worcester,	1	1	–	–
Influenza,	Boston,	2	3	1	–
	Lawrence,	–	1	–	–
	Springfield,	–	2	–	–
Meningitis other than cerebro-spinal.	Hyde Park,	–	–	2	–
	Wakefield,	–	1	–	–
Anterior poliomyelitis,	Fall River,	1	–	–	–
Tetanus,	Boston,	1	–	–	–

WEEKLY RETURNS OF CASES OF INFECTIOUS DISEASES.

Cases of Infectious Diseases reported during the Weeks of May 7, 14, 21 and 28, 1910.

[Under the provisions of section 52 of chapter 75 of the Revised Laws.]

	Week ending—				
	May 7.	May 14.	May 21.	May 28.	Total.
Diphtheria,	141	159	133	156	589
Measles,	713	930	828	719	3,190
Scarlet fever,	430	280	243	194	1,147
Typhoid fever,	35	33	32	32	132
Tuberculosis, pulmonary,	161	178	215	232	786
Tuberculosis other than pulmonary,	1	3	1	1	6
Cerebro-spinal meningitis,	3	3	3	4	13
Meningitis other than cerebro-spinal,	2	2	2	–	6
Whooping cough,	27	27	28	33	115
Varicella,	40	66	46	65	217
Ophthalmia neonatorum,	5	5	1	–	11
Anterior poliomyelitis,	1	–	–	2	3
Mumps,[1]	–	–	1	–	1
Smallpox,	5	4	–	1	10
Erysipelas,[1]	1	–	1	2	4
Tetanus,	4	–	1	–	5
Glanders,	–	–	1	–	1
Leprosy,	–	–	1	–	1

[1] Erysipelas and mumps are not diseases notifiable under section 52 of chapter 75 of the Revised Laws. The figures concerning these diseases are, therefore, incomplete.

MONTHLY REPORT ON INSPECTION OF FOOD AND DRUGS.

The following summary presents the results of the examination of food and drugs made by the State Board of Health during the month of May 1910: —

Articles examined.	Number found to be of Good Quality.	Number adulterated or varying from the Legal Standard.	Total.	Articles examined.	Number found to be of Good Quality.	Number adulterated or varying from the Legal Standard.	Total.
Baking powder,	2	–	2	Malt liquors,	6	–	6
Butter,	3	–	3	Maple sugar,	4	1	5
Canned fruit,	1	–	1	Maple syrup,	1	–	1
Canned fish,	3	–	3				
Cheese,	1	–	1	Meat products: —			
Cider,	1	–	1	Hamburg steak,	1	2	3
Clams,	2	–	2	Sausages,	5	3	8
Cream,	5	–	5	Tripe,	1	–	1
Cream of tartar,	2	–	2	Milk,	539	67	606
Dried fruit,	1	–	1	Olive oil,	12	1	13
Drugs,	26	2	28	Proprietary foods,	3	1	4
Flavoring extracts,	8	2	10	Pickles,	1	–	1
Grape juice,	7	–	7	Spices,	9	–	9
Ginger ale,	1	–	1	Vinegar,	3	2	5
Jams and jellies,	3	–	3	Total,	652	82	734
Lime juice,	1	1	2				

The samples of drugs found to be adulterated were spirits of anise.

The cities and towns in which samples were collected, were: Adams, Andover, Athol, Attleborough, Ayer, Baldwinville, Boston, Cambridge, Canton, Chelsea, Dighton, Easthampton, Falmouth, Fitchburg, Hyde Park, Lawrence, Leominster, Lincoln, Lynn, Lynnfield, Malden, Marlborough, Marshfield, Melrose, New Bedford, Newburyport, North Attleborough, Northampton, Norwood, Pittsfield, Salem, Saugus, Shelburne Falls, Somerville, Stoughton, Waltham, Westfield, Williamstown and Worcester.

PROSECUTIONS FOR VIOLATIONS OF THE LAW RELATING TO FOOD AND DRUGS.

Thirty convictions were secured during the month of May, 1910, for selling adulterated food and drugs, as follows: —

No.	Name of Defendant.	Place.	Character of Article sold.
1	Theodore Carellas,	Springfield,	Renovated butter.
2	William F. Houstin,	New Bedford,	Oleomargarine.[1]
3	John T. Mansfield,	Cambridge,	Oleomargarine.[1]
4	Chas. A. Perry,	Chicopee,	Oleomargarine.[1]
5	Lafael Albano	Springfield,	Lard.
6	Victor Brynicki,	Westfield,	Lard, contained cotton-seed oil.
7	Morris Goldstein,	Pittsfield,	Lard, contained cotton-seed oil.
8	Adolph Klein,	Pittsfield,	Lard, contained cotton-seed oil.
9	Simon M. Tegelwiez,	Westfield,	Lard, contained cotton-seed oil.
10	New England Maple Syrup Company.	Cambridge,	Maple sugar, 50 per cent. cane sugar.
11	New England Maple Syrup Company.	Cambridge,	Maple sugar, 50 per cent. cane sugar.
12	Michael J. Collins,	Lynn,	Milk (total solids, 7.82).[2]
13	Michael Carvellas,	Lynn,	Milk (total solids, 11.29).
14	Michael J. Gearan,	Springfield,	Milk (total solids, 11.83).
15	Frank Gomes,	Lynn,	Milk (total solids, 11.96).
16	Maria Fagan,	Norton,	Milk (total solids, 10.25).[2]
17	Maria Fagan,	Norton,	Milk (total solids, 11.61).
18	Martin H. Healy,	Springfield,	Milk (total solids, 10.80).
19	Foster B. Phelps,	Fitchburg,	Milk (total solids, 11.12).[1]
20	Foster B. Phelps,	Fitchburg,	Milk (total solids, 10.40).[1, 3]
21	Samuel E. Smith,		Milk (total solids, 11.34).
22	Byron L. Towne,	Springfield,	Milk (total solids, 11 06).
23	Chas. Unietes,	New Braintree,	Milk (total solids, 10.56).
24	Lafael Albano,	Springfield,	Olive oil.
25	Morris Goldstein,	Pittsfield,	Sausage (contained cereal).
26	Geo. C. Hodges,	Springfield,	Sausage (contained cereal).
27	Herbert L. King,	Pittsfield,	Sausage (contained cereal).
28	Walter J. Keating,	Lawrence,	Spirit of anise.[1]
29	Geo. B. Ketchum,	Cambridge,	Spirit of anise.
30	Arthur B. Kelley,	Lawrence,	Spirit of anise.

[1] Appealed. [2] Watered. [3] Skimmed.

Fines imposed, $940.

LIST OF ADULTERATED OR IMPROPERLY LABELLED FOODS, ETC., FOR MAY, 1910.

Number of Sample.	Character of Sample.	Name of Manufacturer, Wholesaler or Producer.	Results of Analyses.
11202	West India lime juice,	Hans Johnson Company, Cienfuegos, West India Islands,	Low in acid; contained salicylic acid.
12315	Olive oil,	Olio D'Oliva Pure Italian Olive Oil, Lucca Mulino Brand.	Contained 75 per cent. cotton seed oil.
12066	Milk,	Jacob Spitzer, North Adams, Mass.,	Total solids, 12.05 per cent.; fat, 4.80 per cent.; contained added water.
12139	Milk,	Herbert E. Daniels, North Adams, Mass.,	Total solids, 12.34 per cent.; fat, 4.40 per cent.; contained added water.
12137	Milk,	Thomas H. Scully, North Adams, Mass.,	Total solids, 10.40 per cent.; fat, 2.80 per cent.; contained added water.
12131	Milk,	Jacob Spitzer, North Adams, Mass.,	Total solids, 12.30 per cent.; fat, 4.40 per cent.; contained added water.
12134			Total solids, 13.10 per cent.; fat, 5.00 per cent.; contained added water.
12157	Milk,	Charles Fine, Attleborough, Mass.,	Total solids, 11.36 per cent.; fat, 2.46 per cent.; proteids, 3.35 per cent.; skimmed milk.
12219	Milk,	D. P. Simpson, Hyde Park, Mass.,	Total solids, 11.94 per cent.; fat, 2.90 per cent.; proteids, 3.36 per cent.; skimmed milk.

INSPECTION OF DAIRIES.

During the month of May, 1910, 217 dairies were examined in the following places: —

Place.	Number examined.	Number found to present no Objectionable Features.	Per Cent.	Number concerning which Letters were sent.	Per Cent.
Andover,	18	11	61.11	7	38.89
Second inspection,	12	9	75.00	3	25.00
Ashburnham,	5	2	40.00	3	60.00
Second inspection,	8	5	62.50	3	37.50
Ashland,	10	8	80.00	2	20.00
Second inspection,	7	6	85.71	1	14.29
Third inspection,	1	1	100.00	–	–
Billerica,	1	–	–	1	100.00
Duxbury,	1	1	100.00	–	–
Second inspection,	5	5	100.00	–	–
Haverhill,	15	9	60.00	6	40.00
Second inspection,	77	67	87.01	10	12.99
Hingham,	–	–	–	–	–
Second inspection,	9	6	66.67	3	33.33
Third inspection,	1	1	100.00	–	–
North Andover,	3	3	100.00	–	–
Second inspection,	22	18	81.82	4	18.18
Norwood,	22	11	50.00	11	50.00

Total number of dairies examined,	217
Number found to be free from objectionable conditions,	163
Number concerning which letters were sent,	54
Total number of conditions to which attention was called,	157
Percentage of dairies which passed inspection,	75.12

In addition to the above, 116 dairies were visited at which the sale of milk has been discontinued.

The names of the owners of the dairies found to be worthy of commendation follow: —

Andover.

Abbott, Margaret E.
Abbott, Stephen
Averill George*
Bodfas, Joseph
Carty, George*†
Cress, E. E.*†
Dearborn, L. F.
Foster, Omar
Hacket, W. H.
Hill, A. H.
Jameson, Charles*†
Jenkins, A.*†
Newton, Charles*†
Pearson, Mrs. George*†
Smith, B. Frank*†
Stone, C. A.
Thompson, Andrew
Tschander, Joseph
Watson, Robert*
Way, Frederick

Ashburnham.

Ashburnham Town Farm*
Gates, Charles H.
Lamothe, H. G.
Marble, Alden*
Marble, W. E.*
Proctor, Mrs. Florence
Whitney, Lewis*†

* Second inspection. † Reported favorably on first inspection.

Ashland.

Adams, James
Ashland Town Farm*
Blake, Horace S.*
Dearth, George P.*
Dodd, Daniel
Dustan, Arthur
Loring, Homer
Phimister, George*†
Rockwood, C. P.*
Shea, Joseph
Smith, A. R.*
Southmaid, Edward
Weeks, Fred
Whitney, Joel F.‡
Whittemore, A. C.

Duxbury.

Bay Farm Milk Co.*†
Goulding, A. M.
Hoyt, Frank*†
Parker, Estate of J. K.*†
Peterson, Estate of Alonzo*
Simmons, E. W.*†

Haverhill.

Atwood, Irving H.*
Bailey, John*†
Bailey, Mathew*
Bisby, C. F.*†
Blair, R.*
Blessington, Thomas*†
Blotner, Max
Boardman, A. H.*†
Brickett, A. N.*†
Butterick, A. W.*†
Chadwick, James*†
Charles W. E.*
Christensen, Henry*†
Cogswell, Doane*†
Comean, Leon
Cunninghan, O.*
Day, G. E.*†
Dixon, W. H.*†
Dorothy, Rev. T.*†
Dresser, H. N.
Dwyer, William
Emerson, Charles M.*†
Emerson, E. A.*
Emerson, Estate of Marcus*
Emerson, Mrs. Rufus*†
Fernald, Frank*†
Gilman, S.*†
Gleason, Chauncey*†
Harndon, Otis*†
Haverhill City Farm*†
Hayes, Robert W.*
Haynes, George A.*
Haynes, George W.*
Haynes, Guy*
Haynes, J.*†
Heselton, George*
Hill, C. J.*
Hopkinson, A. F.*
Hussey, John*†
Johnson, Horace*†
Kennedy, James*
Kimball, Asa M.*
Kimball, Fred*†
Kimball, L. H.*
Laberti, N.*
Lawson, C. A.*
Lyons, Otis
Marble, Isaac*†
Martin, G. C.*
McClellan, P. W.*†
McCormick, Jeremiah*†
McElroy, John*†
McMillan, Cyrus*†
Merrill, L. N.*†
Mills, George*†
Nichols, George*
Pettingill, F. H.*†
Poor, C. H.*†
Poor, H. A.*†
Popolasky, A.
Ray, P. N.*†
Reynolds, D. W.
Robinson, Samuel*†
Russ, J. M.*
Sawyer, J. B.*†
Silsby, Edward*†
Smith, S.
Streeter, Frank*†
Swazey, R. H.*
Thornton, F. M.*
Thornton, William*
Towne Bros.*
Webster, C. W.*
Welsh, H. J.
White, William*†
Whittier, A. G.*

Hingham.

Foley, Cornelius‡
Jordan, H. G.*†
Litchfield, Samuel A.*†
Loring, Arthur W.*
Puffer, George C.
Schultz, Henry*†
Stoddard, Harry*†

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* Second inspection. † Reported favorably on first inspection. ‡ Third inspection.

North Andover.

Barker, Jacob*
Bragdon, G. C.*†
Carleton, Daniel A.*
Chadwick, J. G., & Son*
Daly, John
Foster, Frank*
Foster, Orrin W., & Sons*
Frost, Charles G.*
Fuller, A. P.*
Gage, Estate of Nathaniel*
Glennie, James
Goodhue, Frank*†
Greene, E. W.*†
Newhall, Charles R.*†
North Andover Town Farm*†
Poor, James S.*†
Rea, Calvin*†
Rea, George H.*
Rea, Orris*†
Russell, Estate of William A.
Stevens, Estate of Oliver*†

Norwood.

Chamberlain, Ellis
Cottle, George
Dean, Willard
Fisher, Fred L.
Fitzgerald, Daniel
Morse, George H.
Scherer, J. A.
Talbot, Edward
Webber, E. B.
Winslow, H. F.
Wright, Charles

PROPRIETARY PREPARATION ADVERTISED AS UNSALABLE IN MAY, 1910.

Mysterious Pain Cure. Junius Barnes & Son, Proprietors, Burlington, Vt. (No statement of the percentage of alcohol and laudanum.)

TYPHOID FEVER IN NORTH ADAMS DUE TO A CHRONIC CARRIER.

During the year 1902 there was considerable typhoid fever in North Adams, some 65 cases having been reported. There was also a good deal of talk among the physicians about a certain milkman, a Mr. C., who sold milk in many families where the disease occurred, and in one instance, at least, Mr. C. threatened to sue a physician who had advised the family of a customer to make a change in their milk supply.

At the municipal election in December of that year new city officials were elected. This resulted in the appointment of a new board of health, which assumed its duties Feb. 1, 1903. Immediately the board appointed a physician, and assigned, as his first task, the investigation of the excessive amount of typhoid which the city had been having.

The 65 cases reported in 1902 were looked up in detail, each household was visited, and as full a sanitary history as possible of each case was obtained. Thirty-five further unreported cases were found. A tabulation of these cases showed that 21 out of the 100 were located

* Second inspection. † Reported favorably on first inspection.

largely in that part of North Adams called Houghtonville, adjoining Clarksburg, and that all of the 21 obtained milk from Mr. C. This led at once to an investigation of Mr. C.'s milk supply. Mr. C. sold about 75 quarts of milk daily to some 40 or 45 families. He obtained his milk from several sources.

From Mr. O. he secured 30 quarts daily. Mr. O. sold also 100 quarts daily to another retailer, who had no typhoid on his route, hence this supply could be left out of further consideration.

Mr. C. kept one cow, and obtained his water supply from a well midway between the house and barn, both of which were near, and the water was said sometimes to be foul. The sale of milk from this source was forbidden in North Adams by the board of health.

Mr. C. obtained a further supply of milk from the M. and L. dairies. These dairies were visited, and, while minor improvements were suggested and some changes in the water supply required, nothing could be found to explain the infection.

Early in 1903 Mr. C. sold his milk route to a Mr. K., who took over Mr. C.'s supply from Mr. M. and Mr. L., and also bought milk from Mr. Be. Before selling out Mr. C. had 3 cases of typhoid, and during the remainder of the year Mr. K. had 12 cases, making a total of 15 cases for the year where milk from the M. and L. dairies was used. During the year there were 73 cases of typhoid fever in the city.

In 1904, Mr. K., who continued in the milk business, with the same sources of supply, had 4 cases of typhoid fever out of a total of 32. Before the first half of the year was up, on the strength of the above showing, the sale of milk from the M. and L. dairies was forbidden in North Adams by its board of health. In consequence of this restriction the M. dairy ceased the production of milk, and shortly after Mr. K. went out of business.

During 1905, out of 37 cases of typhoid fever 9 were on the route of Mr. Bl. It was found that Mr. Bl. was obtaining milk from Mr. L. With other sources eliminated, the L. dairy seemed to be the one under suspicion. The sale of milk from this source was again forbidden in North Adams.

In 1906 the L. milk was sold to a baker outside of North Adams. In this year there were 32 cases of typhoid, 6 of which purchased milk at the bakery, where L.'s milk was exclusively used.

In 1907, out of 25 cases of typhoid fever, none could be attributed to this source. This was due to the fact that little or no milk was sold from the bakery, one or two families in the neighborhood who kept cows supplying the demand.

In May, 1909, between the 12th and 26th there occurred 7 cases of

typhoid fever in North Adams. An investigation of these cases as they were reported led to the discovery that all but 1 used the products of a certain bakery, the same bakery where L.'s milk was exclusively used. Investigation at the bakery disclosed that 2 of the employees had been or were then ill with typhoid fever, that they worked for several weeks before they went to bed, and that they obtained their milk supply from the bakery where they were employed.

Notwithstanding frequent inspections and questionings at L.'s dairy in the past, no source of infection could be discovered. Further visits at this time brought out the fact that Mr. L.'s daughter, a middle-aged woman, had had typhoid fever in New York State over fifteen years ago. A sister had gone from her home here to care for this daughter, contracted the disease and died, while this daughter recovered, and soon returned to her father's home in Clarksburg, bringing her two children with her. Here she has lived since. During this fifteen years she has had five children. All seven children are well, and none of them have ever had any serious illness. The mother has had no other illness beyond what was associated with child bearing.

This information led to the taking of an immediate Widal test, which was positive. Following this, specimens of the urine and feces were examined at three different times. The first examination resulted in the finding of bacilli which closely resembled the paratyphoid bacillus. The second and third examinations were negative.

Since May, 1908, to the present time (October, 1909), there have been no cases of typhoid fever which could be traced to this source. This present season the production of milk for other than their own family use has been discontinued.

The absence of cases of typhoid fever from this source previous to 1902 is explained in that till then no milk was produced on the farm except for their own family use. At that time additional cows were purchased, and the milk was sold to Mr. C., as previously mentioned.

That the cases due to this infection were irregular in their appearance and number seems easily explanable, in considering the probable mode of infection of the milk. As a rule, Mr. L.'s daughter has had nothing to do with the milk. But the milk was taken into the kitchen for straining, and the cans were washed there. Nothing could be more natural than that, under special circumstances, the daughter volunteered to assist her father in the handling of the milk or utensils.

During the fly season further opportunity for infection also occurred, in that the privy was not far from the house, and was not screened from the flies, while the cans were left to dry near the house, where the flies found ready access to them.

In these two ways is the appearance of the disease traced to this source, irregularly, and at intervals to be accounted for.

It is also worth noting that while the L. dairy never produced over one one-hundredth part of the milk consumed daily in North Adams, one-fifth of all the typhoid in the community occurred in cases where this milk was used, if a few secondary cases be included. This proportion would be increased somewhat were the imported cases deducted.

WHAT THE MAYOR AND CITY COUNCIL CAN DO IN THE PREVENTION OF TYPHOID FEVER.[1]

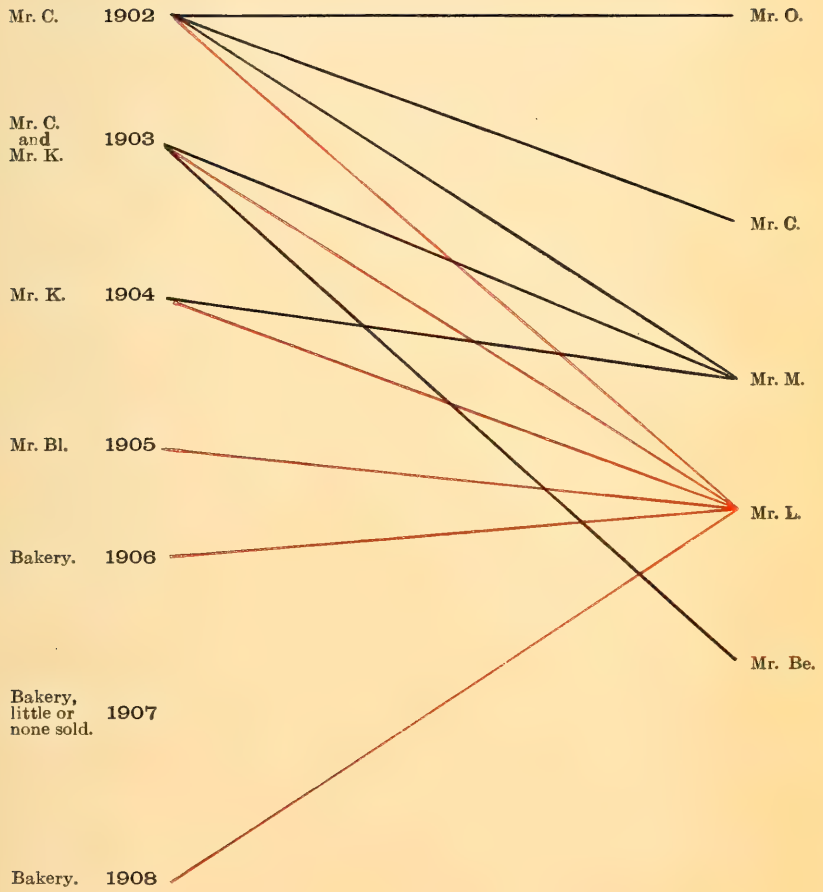
By L. L. LUMSDEN, *Passed Assistant Surgeon, United States Public Health and Marine-Hospital Service.*

Since the early dawn of civilization the conservation of human health has been a problem in the minds of men, and has received more or less consideration from those responsible for the welfare of the tribes and nations. Public hygiene was cultivated to some extent among the ancient Egyptians, and in the code of sanitary laws given to the children of Israel by Moses there is contained much that might be adopted advantageously by many of our communities in the twentieth century.

From time to time infectious diseases have swept as great epidemics over different parts of the world. The people, rudely and terribly awakened to the existence of these devastating scourges, have groped in darkness to find ways of escape. Various and at times most fantastic hypotheses have been adopted to account for the visitations. In this dense wilderness of doubt and fear, of superstition and ignorance, there have appeared from time to time men of science who, basing their conclusions on carefully observed facts, have blazed a trail toward the light. In the nineteenth century many men of this type appeared and wonderful progress was made.

The twentieth century, bringing the accumulated knowledge of the past, presents us with wonderful opportunities. Efficient methods of preventing most of the widely prevalent infectious diseases are now perfectly clear. Shall we endeavor to apply these methods, or shall we await the developments of the future in the hope that methods of easier application may be discovered? Such postponement would seem no more justifiable here than it would in other fields of endeavor for the betterment of the human race. While awaiting the discovery of better methods innumerable lives may be needlessly lost. It is,

[1] Read at the annual convention of the Carolina Municipal Association, held at Winston Salem, N. C., June 2 and 3, 1910. Reprinted from Public Health Reports, Public Health and Marine-Hospital Service, Washington, D. C., June 17, 1910.



To illustrate how the L. dairy was the one common source of infection during the years in question, Lines in red represent the distribution of the L. supply.

therefore, a plain duty for us to employ to the best possible advantage such instruments as we have at hand, the efficiency of which has been demonstrated.

Application of Methods to Prevent Infectious Diseases.

Although efficient methods to prevent most of the infectious diseases are now well known, yet in many instances the securing of ways and means to get these methods applied in a given community remains a grave and difficult problem. To the inexperienced the passage of laws requiring the enforcement of the methods would seem a simple solution of this problem. Convince the average citizen of the existence of some condition deleterious to the community and at the same time remediable, and as a rule he will say, "There ought to be a law against it." This observation in many instances is no doubt quite true, but the practical question which always arises in this connection is, Is the community ready for such a law? In other words, are the people willing to be subjected to such inconveniences and curtailment of personal liberties as may follow the enactment of such a law for the benefits which may accrue? Ruskin once somewhat cynically observed: —

> Any interference which tends to reform and protect the health of the masses is viewed by them as unwarranted interference with their vested rights to inevitable disease and death.

Such a view among "the masses" is certainly becoming more and more exceptional. If the people have the facts about a grossly insanitary condition properly presented to them, they will, as a rule, become convinced of the advisability of having such condition corrected, and not only tolerate, but in some instances demand, interference by the sanitary authorities.

The people generally, under the various educational influences of modern times, are adopting higher and higher standards of sanitation. Conditions which were once viewed with indifference or helplessness are now abhorred.

Under a republican form of government no law can be successfully enacted which does not represent the strong convictions of a strong majority. The people, having the power of appointment of the makers and the administrators of the law, are the ultimate arbiters of the form of government under which they shall live. Education of the people, taken in a broad sense, is, therefore, essential to advancement in sanitation, or disease prevention, as in other measures for the uplift of our nation.

The adage "Nothing succeeds like success" is particularly applicable

to the work of disease prevention. In these days of publicity a successful fight against a disease in any particular community will be heralded abroad, and may have a widespread — even a world-wide — educative influence. Among the many brilliant achievements in sanitation within recent years which have had such influence a few may be mentioned: the eradication of yellow fever from Habana, Cuba, and New Orleans, La.; the sanitation of the Isthmian Canal Zone in Panama; the eradication of bubonic plague from San Francisco, Cal.; the marked reduction in hookworm disease in Porto Rico; and the eradication of typhoid fever from Trier, Ger.

A successful campaign against one infectious disease in a community educates to a considerable extent the people of that community to an understanding of the feasibility of successful campaigns against other infectious diseases. The proper disposal of sewage in order to eradicate hookworm disease can be expected to effect a very marked reduction in the prevalence of typhoid fever, because both hookworm disease and typhoid fever are caused by infections which are disseminated, primarily, essentially and solely, from faultily disposed-of excreta from human beings. The prevention of sewage-borne infections is certainly one of the most vitally important economic problems with which our southern States are confronted to-day. There is abundant indisputable evidence that the proper disposal of human sewage will prevent typhoid fever, hookworm disease, the dysenteries, much of the diarrheal disease of infant and adult life, and many of the diseases caused by the larger animal parasites; by preventing these and perhaps many other infections, it will probably operate to markedly reduce the prevalence of tuberculosis, pneumonia and other diseases, possibly including pellagra.

Thus in proper sewage disposal we have a measure which is of remarkably broad application in the prevention of disease. As a simple prescription, with "shot-gun" effects, it can be most highly recommended for the ills of the community.

With the facts which the accumulated knowledge of the ages lays before us, can any one doubt the wisdom of a municipality when it spends sufficient money to secure a proper disposal of its own sewage and to prevent, to a reasonable degree, the spread of infection coming through various media from the sewage of other communities? Can any one doubt the wisdom of a dweller in a rural section when he expends a few dollars or a little labor for the construction and management of a sanitary privy, and thereby saves in doctors' bills alone many times over the amount of his expenditure. The value of the health and happiness preserved to the people by the use of this simple sanitary device cannot be measured on a monetary basis.

Typhoid fever presents itself as a striking example of the diseases due to sewage-borne infections, and therefore may be appropriately taken up for somewhat specific consideration.

Prevalence of Typhoid Fever.

Typhoid fever has been defined as a "disease of civilization," but as Sedgwick well says: —

> It ought to be clearly understood that it is only a disease of defective civilization, for it has gradually become notorious that the widespread or frequent occurrence of typhoid fever in any community must be due somehow to defective sanitation, and defective sanitation means defective civilization.

There are in the United States comparatively few communities over 1,000 persons which, during any period of twelve consecutive months within the last decade, have been entirely free from typhoid fever. According to the Census Report for 1900, the average typhoid fever death rate in the United States was 46.5 per 100,000 inhabitants. This means that in the census year, which may be taken as an average, there were about 500 cases of and over 46 deaths from typhoid fever among every 100,000 persons composing the American nation. The total number of deaths from typhoid fever recorded that year was 35,379, which gave this disease fourth place on the mortality list.

The rate of prevalence of typhoid fever in the United States in comparison with the rates in other countries is high. Thus the annual typhoid death rate per 100,000 population for the period of 1901-05 was in Scotland, 6.2; in Germany, 7.6; in England and Wales, 11.2; in Belgium, 16.8; in Austria (1901-04), 19.9; in Hungary, 28.3; in Italy, 35.2; while the rate in the United States during the same period was about 46 (estimated).

Do not these figures plead eloquently that in the development and exploitation of the wonderful natural resources of our country it is high time that serious consideration be given to measures for the conservation of that most important of all our resources, the nation's health?

Some of the European countries now having relatively low typhoid rates formerly had high rates. Their climatic conditions seem to be as favorable to typhoid infection as those of the United States as a whole. Therefore it appears reasonable to conclude that their decidedly lower typhoid rates have been brought about by their better enforcement of the preventive measures.

In the United States the disease is especially prevalent in the south. According to the figures of the United States Census Report for 1900, the 10 States which had the highest typhoid death rates (average, about

79 per 100,000) are all States located south of the Potomac and east of the Mississippi rivers; the 10 States which had the lowest rates (average, about 20 per 100,000) are all northern or western States. Some of the northern States formerly had high rates, as high as or higher than those which some of the worst affected southern States have had in recent years. In Massachusetts, for example, in the decade 1871-80 the average annual typhoid death rate was 62 per 100,000, while in the period 1901-05 it was 18.2.

The lowered typhoid death rates in the northern States have followed improvements in the water and milk supplies, the installation of better sewage-disposal systems and improvements in general sanitary conditions. The high rate of prevalence of typhoid fever in the south may reasonably be attributed to the following conditions: —

1. Faulty sewage disposal, incident to the relatively large rural population, and, particularly, as pointed out by the investigations of Stiles,[1] to the large percentage of negroes in the population.

2. Climate; the long periods of warm weather, when there are additional agents for the transmission of the infection, such as flies and other insects, and when greater quantities of uncooked foods and beverages are consumed and there is probably increased individual susceptibility to the infection.

It is certainly possible, and by some regarded as even probable, that whatever increased susceptibility to typhoid infection may exist in warm weather is due largely to the ingestion of organisms which are disseminated from faultily disposed-of human excreta. If this hypothesis be correct, it is certain that the proper disposal of sewage will completely prevent the operation of all the factors in the production of typhoid fever which are particularly favored by warm weather conditions.

Considering the number of communities in the south in which polluted water supplies have been used for long periods, it is a notable fact that there have been reported in the south no pronounced and extensive epidemics of typhoid fever caused by water-borne infection. It may be that the causative organisms in the relatively warmer river and lake waters of the south do not survive in sufficient numbers to cause pronounced epidemics. In some communities in the south, as has been shown for some in the north, water may play an important part, but judging by the limited data available, it seems probable that water is a relatively much less important factor in the spread of the infection in the south than it is in the north.

Not many years ago typhoid fever was regarded quite generally as

[1] "Hookworm Disease and the Negroes," Hampton Leaflets, September, 1909; by Ch. Wardell Stiles.

being largely or even entirely a water-borne disease, and the purity of a community's water supply was estimated from the typhoid death rate. Careful epidemiologic studies have shown that in some communities there may be a high typhoid death rate due largely or even entirely to factors other than water in the spread of the infection, and sanitarians now regard the typhoid death rate of a community as a fair measure of the intelligence exercised by that community in respect to sanitation in general.

Nature and Source of the Infection.

The modes of dissemination and the means for the prevention of typhoid fever are now quite well known, — in fact, there are few other infectious diseases about the spread of which so many convincing facts have been recorded. Notwithstanding the accumulated knowledge and its ready availability, the general public still, in too frequent instances, is found to be woefully ignorant of the nature of typhoid infection and of the fact that the disease is thoroughly preventable. In many communities the people regard the occurrence every year of a certain amount of typhoid fever as inevitable, and accept it with complacency. But if in one of those same communities a few cases of Asiatic cholera should occur, the people generally would become keenly awake to the situation and urgently demand protection. The newspapers would publish, on front pages with glaring headlines, vivid accounts of the disease; the purse strings of the public treasury would be loosened, and if the funds there were not sufficient to meet the emergency, more could readily be obtained by popular subscription. In consequence of these earnest activities Asiatic cholera would soon be eradicated. Typhoid fever is just as preventable as is Asiatic cholera, and, it so happens, is spread in exactly the same ways and can be eradicated by exactly similar measures. Both diseases are caused by germs which are parasitic in nature and dependent upon man as their permanent host for their continued existence. These germs are contained in the dejecta from the bodies of infected persons. From such dejecta they may be conveyed by various agents, such as water, food, fingers, flies, etc., to the alimentary canals of healthy persons, and so be continued on their disease and death-dealing course. To prevent these diseases it is evident, therefore, that all that is necessary is to disinfect the excreta from infected persons, or to dispose of these excreta in such a way that the germs contained in them cannot be conveyed to other persons. This plan of action seems simple enough, and if it can be made sufficiently wide in scope, it will undoubtedly prove successful. The problem has, however, certain complications which increase the difficulties of its solution.

1. Certain persons continue to harbor the germs in their bodies and

to discharge them in their excreta for weeks, months or even years after complete recovery from clinical symptoms of the disease. Other persons contract the infection, and, although never having a clinically recognizable attack of the disease, become germ carriers. In order to safeguard the community against these sources of infection it is necessary to have the sewage of all persons — the sick and the well — properly disposed of.

2. The persons in a given community may use water, milk and various foodstuffs coming from a distance and liable to be contaminated with the excreta from infected persons over whom their own local officials have no jurisdiction; thus the problem may become of State, national or even international extent.

But these difficulties are not insurmountable. Should the disaster of a cholera epidemic fall upon this country there is not a question of doubt that effective measures for its eradication would be promptly adopted. Since this is true for cholera, it seems evident that it is the duty of every good citizen to strive with might and main to awaken the people from their lethargy in respect to the preventability of typhoid fever.

Functions of the Mayor and City Council.

The functions of the governing body of the municipality are legislative, administrative and educative. In performing one of these classes of functions it performs to some extent the others also. If laws be made wisely they can be administered successfully. The successful administration of wise laws — laws for the public welfare — will exert an educative influence upon the people, and so facilitate the subsequent enactment of laws of similar character. It is also true in these days of an awakening public that the enactment of flagrantly bad laws will have an educative effect, in some instances with disastrous consequences ensuing to the perpetrators of such laws.

The men in a municipality who are elected by the people to the mayoralty and to the city council are so elected because the majority of the people are made to believe that they will advance the best interests of the municipality. In some instances — exceptional ones now, let us hope — an organized and active minority may elect candidates to represent special interests which are opposed to the best interests of the unorganized and inactive majority. But in these days of publicity, and of civic federations the opportunities of those who work for such selfish interests are becoming fewer, and the ways of the transgressor harder.

Officials who would advance the best interests of the municipality should know that one of the most important and vital of all these interests is the conservation of the health of the people. In this connection the great English minister, Disraeli, once said: —

Public health is the foundation upon which rest the happiness of the people and the power of the State. Take the most beautiful kingdom, give it intelligent and laborious citizens, prosperous manufactures, productive agriculture; let arts flourish, let architects cover the land with temples and palaces; in order to defend all these riches have first-rate weapons, fleets of torpedo boats, — if the population remains stationary, if it decreases yearly in vigor and in stature, the nation must perish. And that is why I consider that the first duty of a statesman is the care of public health.

Of the widely prevalent infectious diseases none promises better results from equivalent amounts of intelligent effort at prevention than does typhoid fever, and in the prevention of this disease, therefore, municipal officers have a great opportunity.

What the Mayor and City Council can do in the Prevention of Typhoid Fever.

1. *Become informed as to the Nature of the Infection, its Modes of Spread and the Methods to prevent it.* — This information is now readily available. It may be obtained by applying to the local health office, the State Board of Health or to the United States Public Health Service at Washington. Any one possessed of moderate intelligence can learn this simple lesson in hygiene, and it is the plain duty of every good citizen, particularly of those composing the governing body of the municipality, to at least try to learn it.

2. *Make Disease Prevention a Conspicuous Policy of the Administration.* — Such a policy is undoubtedly a most praiseworthy one, and if adopted with common sense and propriety can be made a most popular one. A candidate for re-election to the mayoralty or city council can point unhesitatingly to his achievements in protecting the health of the people as one excellent reason for his continuance in office. It has been remarked that "practical politicians in a municipality usually regard the health office, not as a political asset which may be used to advantage in campaigns, but as a grave liability with a great capacity for getting the administration into trouble." This estimate is not necessarily correct, and within recent years it has been realized in a number of instances that the good record of the city health office may be used as one of the winning cards in local campaigns.

3. *Make Efficiency the Primary Basis of Appointments to Positions in the Health Office.* — It is the health officer's success in disease prevention and not his particular political affiliations which will reflect credit upon the administration. His work is of a highly specialized character, requiring of him, for its successful accomplishment, special technical

training. The intelligent individual citizen, when ill, engages as his physician one whom he believes to be skilled in his profession, and in his selection gives little or no consideration to the political affiliations of the physician. The municipality should exercise similar intelligence in selecting its physician — the health officer. The administration in retaining in office an efficient city health officer, who has been appointed by a previous administration deserves, and usually will get, the approbation of the people. The administration in dismissing from office such an incumbent, and appointing in his place a decidedly less efficient man, deserves, and should get, the grave censure of the people.

4. *Provide Adequate Salaries for Health Officers.* — The salaries paid health officials, particularly of cities having less than 100,000 population, are, as a rule, ridiculously small. In consequence, active and efficient services cannot be expected. The man of ability who holds the position of health officer usually cannot afford to give up his other and more lucrative work in order to devote his time exclusively to the duties of the health office. The salary should be made commensurate with the duties and responsibilities of the position, and the municipality should then demand that the duties of the position be energetically performed.

5. *Appropriate Funds for Sanitary Improvements as liberally as the Taxation Rate will permit.* — In the average municipality there are so many public improvements needed which the funds of the treasury are inadequate to provide that it is, no doubt, very difficult at times for the municipal authorities to determine to what purpose the scanty funds can best be put. Of the conditions affecting the welfare of the whole people of a community, a good sewerage system and a good water supply are certainly among the most vitally important. If the treasury funds are insufficient to provide these, the city authorities should keep the facts clearly and persistently before the people. By so doing, the people eventually may be made to understand and become not only willing but anxious to supply the necessary funds.

6. *Provide for the Collection of Mortality and Morbidity Statistics so that the Results of Sanitary Work may be known.* — This can be done with very little cost to the municipality. The enactment of an ordinance requiring physicians to report cases of infectious disease, and undertakers to file certificates of causation of death in order to obtain burial permits, will accomplish it. Without these statistics, which are the "bookkeeping of sanitary science," it is practically impossible to tell what progress is being made. In some instances the attempt may be made to conceal the facts about health conditions in a city for fear that if the conditions become known the business interests will be injured. It is just about as easy for a community to succeed in such concealment as it is for a man

to conceal the fact that he has a broken leg by making efforts to run. The tactics are bad and the results usually disastrous. It certainly seems more in accordance with sound business principles for a city to know its health conditions, to improve them, and then use the improved conditions as a basis for legitimate advertising.

7. *Provide for the Proper Care of the Sick.* — For every case of typhoid fever originating in a municipality, the municipality is to a large extent responsible. The patient's bedside is a fountain head of infection. There the infection may readily be destroyed, but once allowed to escape from there, it may be disseminated in various ways, and become very difficult, or practically impossible, to trace and destroy. Therefore, the municipality, not only on account of its ethical obligation for the development of the case, but also to safeguard the community, should provide for the necessary precautions at the bedside of the patient. If the patient's family cannot be coerced into carrying out the measures, the municipality should provide either hospital accommodation or free nursing and disinfectants.

8. *Keep in Close Touch with and support the Health Officer in his Work.* — You fight a common enemy, and unless you have concerted action you cannot expect to wage a successful warfare. When the mayor and city council cannot agree with the health officer on the plan of campaign, it is time either for that mayor and city council or for that health officer to be removed from office.

9. *Co-operate with the Authorities of Other Municipalities, of the State and of the Nation.* — A municipality which dumps its untreated sewage into a stream used as a source of water supply by municipalities downstream cannot consistently ask the municipalities upstream not to pollute this water with their sewage. In sanitation, municipalities, even as individuals, may adopt to practical advantage the good old golden rule "to do unto others even as you would have them do unto you."

10. *Teach by Precept and by Example the Precautionary Measures.* — The mayor and the city councilmen have been honored with the confidence of the people and have been appointed to the leadership of the municipality. Therefore their conduct, in respect to the simple rules of sanitation at least, should be exemplary. What they do quietly and consistently to safeguard their own households may impress some of their neighbors more profoundly than what they proclaim from the rostrum in the heat of political campaign. If they believe the water is polluted, they should use boiled water in their own homes. If they believe the milk supply is dangerous, they should have it pasteurized before giving it to the members of their own households. If they believe that from faultily disposed sewage disease may be spread, they should have sanitary

water-closets or privies at their own homes. In short, teach by deeds as well as words.

Such are some of the things which the mayor and city council can and should do in the prevention of typhoid fever. Summed up, just this: they can and should do their plain duty as city officials, as citizens, and as men.

And let no one suppose that this is a matter in which he has no personal interest. The duty itself we may evade, but we can never be sure of evading the penalties of its neglect. This disease not seldom attacks the rich, but it thrives most among the poor. But by reason of our common humanity we are all, whether rich or poor, more nearly related here than we are apt to think. The members of the great human family are, in fact, bound together by a thousand secret ties of whose existence the world in general little dreams and he that was never yet connected with his poorer neighbor by deeds of charity or love may one day find, when it is too late, that he is connected with him by a bond which may bring them both, at once, to a common grave. — *William Budd, "Typhoid Fever," London, 1873.*

RULES AND REGULATIONS GOVERNING THE PRODUCTION, CARE AND DISTRIBUTION OR SALE OF MILK IN THE CITY OF LOWELL.

We reprint herewith rules and regulations governing the production, care and distribution or sale of milk in the city of Lowell, which regulations were adopted by the board of health of that city on Dec. 3, 1909.

In the discussion which has recently taken place concerning the milk question in this State it has been very apparent that the interests of the consumers have not received the same attention as has been given to the producers of milk and the contractors. Toward the end of the legislative session, to be sure, it began to appear that the general public had some rights in the matter, but the Legislature adjourned without giving any important aid to those who were striving for a more efficient milk inspection.

It has been very clear to those who knew most about the subject that very little improvement could take place until the authorities in cities and towns took a more active interest in the milk question than they have in the past. It is, therefore, very gratifying to see that the city of Lowell has taken the initiative, and has made regulations which will prevent the sale in that city of milk which does not come from dairies approved by the local health authorities. If the example of Lowell were followed by other cities and towns throughout the State there can be

no doubt that the general conditions of health of the population of the Commonwealth, and especially the conditions of health in infants and children, would be improved to a very marked extent, and within a very short time.

The board of health of the city of Lowell, Mass., hereby makes and publishes, as required by the Revised Laws of Massachusetts, chapter 75, section 14, the following "Rules and Regulations" governing the production, care and distribution or sale of milk in the city of Lowell: —

Rule 1. No person shall sell or distribute milk in the city of Lowell except in accordance with the Revised Laws of Massachusetts, chapter 56, and in the acts which amend the same and the rules adopted by the Lowell board of health.

Rule 2. All persons who wish to engage in the sale, delivery or distribution of milk in the city of Lowell shall first make application for permission so to do upon blanks provided for that purpose, and annually thereafter on or before March 1, and no license will be issued until all regulations governing the production and care of milk are complied with by the dairies which supply milk to the applicant. Such dairies will be inspected by the board of health of Lowell, and no license will be granted for the distribution or sale of milk which is produced or obtained at any dairy which fails to comply with these regulations or which at any time refuses permission to any inspector of this board to examine into its conditions.

Rule 3. All persons engaged in the sale, delivery or distribution of milk in the city of Lowell shall file with the board of health, upon proper blanks provided, a list of the dairies or farms, and their location, from which the milk so distributed is obtained, and shall, before making any changes in their supply, notify the board of health in writing of such intended changes. Any person neglecting to comply with this regulation, or who dispenses milk from any dairy whose milk has been excluded from Lowell by this board, shall have his license revoked.

Rule 4. All wagons or other vehicles and utensils used in the conveyance of milk for distribution or sale in Lowell shall be kept at all times in a clean condition and free from offensive odors. Receptacles containing milk shall at all times during transportation be properly covered. Each wagon or vehicle used for the sale, delivery or distribution of milk shall have the name of the owner, residence and license number painted thereon. Milk utensils shall not be used for containing any other substances whatsoever.

Rule 5. No certificate will be issued for the sale of milk in any store, shop, market or bakery or other establishment outside of a properly equipped milk plant, except in properly labeled and stoppered bottles. All milk so kept for sale must be maintained at a temperature below 50 degrees Fahrenheit, in a suitable refrigerator or cooler, properly drained and cared for, and as approved by the board of health. The attendant making a sale of milk may transfer it to a container furnished by the customer at the time

of purchase, but no bottle of milk shall be left unstoppered. A special permit must be obtained for the sale of milk from bulk containers to be drunk on the premises.

Milk distributors may obtain permission from the board to deliver milk in bulk containers to boarding houses, restaurants, etc., in sealed cans, but they must first file at the office of the board of health a list of such places, and the said list must be approved by the board of health.

Rule 6. Bottles shall be filled only at a dairy or milk plant, or in such other manner as may be acceptable to the board of health. In no case shall milk bottles be filled from the delivery wagon or from bulk containers, left in places where milk is sold. All milk sold in bottles shall have a properly fitting stopper which shall have stamped thereon the name and license number of the dealer supplying the milk. Milk tickets shall not be used a second time. No can or utensil used to contain milk shall be transported in any vehicle used for conveyance of garbage or other material, or in any other manner liable to cause milk contamination.

Rule 7. No milk bottles shall be removed from any place where scarlet fever, diphtheria, membraneous croup or typhoid fever exists, until such bottles have been thoroughly washed and sterilized by boiling them for fifteen minutes, said sterilization to be done by the party using the milk. Any dealer receiving such bottles not so treated, or at any time refilling bottles which have not been to his knowledge properly washed and sterilized, will have his license suspended or revoked.

Rule 8. No milk shall be delivered, held or offered for sale in Lowell from cows that are either diseased, not properly cared for or kept in any stable which is not at all times maintained in a clean, wholesome and sanitary condition; or from any dairy refusing permission of inspection to the Lowell board of health as to the equipment and methods used in producing milk.

Rule 9. The board of health will issue a permit to any dairy wishing to send milk to Lowell after an approved sanitary inspection has been made, and a permanent dairy number will be assigned to each dairy farm, to be used by dealers and this department for purposes of identification. No dairy will be considered acceptable if the milk room contains a urinal, privy or water closet.

Rule 10. No milk shall be brought into, held, delivered or offered for sale in Lowell from cows within fifteen days before or five days after parturition, nor from any cow having any inflammatory disease of the udder.

Rule 11. No person engaged in the business of producing milk to be sold or distributed in Lowell shall store, cool, mix or strain said milk in any room which is occupied by horses, cows or other animals, or for the storage of manure, or in any room used in whole or in part for domestic or sleeping purposes, or in any room not satisfactory to the board of health. All rooms in which milk is stored, cooled, mixed or strained shall be kept clean at all times to the satisfaction of the board of health, and all utensils employed in the storage, sale or distribution of milk shall be washed with boiling water or sterilized with live steam before they are again used.

Rule 12. All milk produced for distribution or sale in the city of Lowell shall be strained and cooled to 50 degrees Fahrenheit, or lower, as soon as it is drawn, but it shall not be cooled or stored in any well, drinking trough used for watering animals, or in any receptacle located in a barnyard, or other places not approved by the board of health. In handling and storing milk the importance of protecting it from flies shall always be borne in mind, and proper screens used for this purpose. No milk shall be held, distributed or sold in Lowell at a temperature above 60 degrees Fahrenheit.

Rule 13. Every person engaged in the production, storage, transportation, delivery or distribution of milk to be sold in Lowell shall notify the board of health of Lowell immediately on the occurrence of any case of diphtheria, membraneous croup, scarlet fever or typhoid fever, either in himself or in his family, or amongst his employees or their immediate associates, or within the building or premises where milk is stored, handled or distributed; and at the same time shall suspend the sale and distribution of milk until authorized to resume the same by the board of health of Lowell.

Rule 14. Any person who shall violate any of the within rules and regulations where the penalty is not prescribed by statute shall forfeit a sum not exceeding $20, and the suspension or revocation of the license, at the option of the board of health.

FOR THE PREVENTION OF OPHTHALMIA NEONATORUM.

Acts of 1910, Chapter 458.

An Act relative to the prevention of ophthalmia neonatorum.

Be it enacted, etc., as follows:

Section 1. The state board of health shall furnish, free of cost, to physicians registered under the laws of the commonwealth such prophylactic remedy as it may deem best for the prevention of ophthalmia neonatorum.

Section 2. To carry out the provisions of this act there may be expended annually from the treasury of the commonwealth a sum not exceeding twenty-five hundred dollars. [*Approved April 27, 1910.*

ADULTERATION OF FOOD PRODUCTS WITH CANE SUGAR, AND THE LABELING OF CANNED GOODS OR DRIED FOOD PRODUCTS.

Acts of 1910, Chapter 528.

An Act relative to the adulteration of food products with cane sugar and the labeling of canned goods or dried food products.

Be it enacted, etc., as follows:

Section 1. Subdivision eight of section eighteen of chapter seventy-five of the Revised Laws is hereby amended by striking out the word "but", in

the thirtieth line of said section, and inserting in place thereof the words: — but this paragraph shall not be construed as permitting the use of cane sugar in maple syrup, maple sugar, honey, cocoa, or any other food product in which the presence of cane sugar as a preservative is unnecessary. Furthermore, — so as to read as follows: — 8. If it contains any added antiseptic or preservative substance, except common table salt, saltpetre, cane sugar, alcohol, vinegar, spices, or, in smoked food, the natural products of the smoking process; but this paragraph shall not be construed as permitting the use of cane sugar in maple syrup, maple sugar, honey, cocoa, or any other food product in which the presence of cane sugar as a preservative is unnecessary. Furthermore, the provisions of this definition shall not apply to any such article if it bears a label on which the presence and the percentage of every such antiseptic or preservative substance are clearly indicated, nor shall it apply to such portions of suitable preservative substances as are used as a surface application for preserving dried fish or meat, or as exist in animal or vegetable tissues as a natural component thereof, but it shall apply to additional quantities. Said definition shall not apply during the year nineteen hundred and two to goods which were held in stock by retail dealers prior to the first day of January in said year. The provisions of this and the two preceding sections relative to food shall not apply to mixtures or compounds not injurious to health and which are recognized as ordinary articles or ingredients of articles of food, if every package sold or offered for sale is distinctly labeled as a mixture or compound with the name and per cent of each ingredient therein.

Section 2. Section twenty-three of said chapter seventy-five is hereby amended by striking out the words "maple syrup", in the fifth line, the word "or", in the sixth line, and the words "of the goods", in the eighth line, by inserting after the word "ingredients", in the eighth line, the word: — thereof, — so as to read as follows: — *Section 23.* All canned articles of food which have been prepared from dry products and have been soaked before canning shall be plainly marked by an adhesive label having on its face the word "*soaked*" in letters of legible type not smaller than two line pica. All cans, jugs and other packages containing molasses shall be plainly marked by an adhesive label having on its face the name and address of the person who made and prepared the same with the name and quality of the ingredients thereof in letters of the size and description aforesaid.

Section 3. This act shall take effect on the first day of April, nineteen hundred and eleven. [*Approved May 18, 1910.*

LABELING OF CRUDE AND REFINED WOOD ALCOHOL.

ACTS OF 1910, CHAPTER 541.

AN ACT RELATIVE TO THE LABELING OF CRUDE AND REFINED WOOD ALCOHOL.

Be it enacted, etc., as follows:

SECTION 1. Whoever, himself, or by his servant or agent, or as the servant or agent of any other person sells, exchanges or delivers any wood alcohol, otherwise known as methyl alcohol, either crude or refined, or denatured alcohol which contains any methyl alcohol, under or by whatever name or trade mark the same may be called or known shall affix to the bottle or vessel containing the same a label bearing the words, "Poison, Not for Internal Use," in red letters of uncondensed Gothic type not less than one fourth of an inch in height, and the same words, "Poison, Not for Internal Use," in stencilled letters of similar Gothic type of a size not less than three fourths nor more than one and one half inches in height for use on barrels and kegs. Whoever violates any provision of this section shall pay a fine of not less than fifty nor more than two hundred dollars for each sale in respect to which the violation occurs.

SECTION 2. Whoever, himself, or by his servant or agent, or as the servant or agent of any other person sells, exchanges or delivers, or has in his possession with intent to sell, exchange or deliver, any article of food or drink, or any drug intended for internal use, containing any wood alcohol, otherwise known as methyl alcohol, either crude or refined, under or by whatever name or trade mark the same may be called or known, shall be punished by a fine of not less than two hundred dollars, or by imprisonment for not more than thirty days, or by both such fine and imprisonment.

SECTION 3. Chapter two hundred and twenty of the acts of the year nineteen hundred and five, relative to wood alcohol, is hereby repealed. [*Approved May 23, 1910.*

REGULATING THE HUMIDITY AND TEMPERATURE OF THE ATMOSPHERE IN TEXTILE FACTORIES.

ACTS OF 1910, CHAPTER 543.

AN ACT RELATIVE TO REGULATING THE HUMIDITY AND TEMPERATURE OF THE ATMOSPHERE IN TEXTILE FACTORIES.

Be it enacted, etc., as follows:

SECTION 1. In every weaving and spinning department in a textile factory wherein water is introduced for humidifying purposes there shall be provided, maintained and kept in correct working order, for the purpose of recording and regulating the humidity of the atmosphere and the tempera-

ture, at least one set of standardized wet and dry bulb thermometers, and, if required by a state inspector of health, two sets of such thermometers, and the following regulations shall be observed in the use of the thermometers: (a) The thermometers shall be placed as directed or sanctioned by a state inspector of health, and shall be plainly visible to the workers. (b) The occupier or manager or person for the time being in charge of the weaving or spinning department in question shall read the thermometers thrice in the day, namely, between seven and eight o'clock in the forenoon, between ten and eleven o'clock in the forenoon and between three and four o'clock, except in rooms which are lighted by gas, and then between four and five o'clock, in the afternoon of every day on which any persons are employed in any weaving or spinning department, and he shall record the readings of each thermometer in such department at each of the said times upon a form provided for the purpose, which, together with the regulations relating thereto, shall be furnished by the state board of health. The records of the readings shall not be destroyed until they have first been seen by the state inspector of health in whose district the factory is situated, and then not without his knowledge and consent.

Section 2. Section one shall not apply to textile factories already equipped with, or which become equipped with, such a number and type of standardized self-registering hygrometers, or psychrometers, or hygrometric system, as meet the approval of the state board of health, provided that the manner of using the same is approved by the state inspector of health in whose district the factory is situated, and provided that the records of the readings from the said hygrometers, or hygrometric system installed, are not destroyed without the knowledge and consent of said inspector.

Section 3. Section one shall not apply to textile factories the occupier or manager or person in charge of which makes use of the sling hygrometer with the express purpose of quickly and accurately determining the actual moisture and temperature of a weaving or spinning department as frequently and in such a manner as is approved by the state inspector of health in whose district the factory is situated, and provided that the records of the readings from the use of the said hygrometer are not destroyed without the knowledge and permission of said inspector.

Section 4. No owner, occupier or manager or person for the time being in charge of a textile factory shall permit the relative humidity in a weaving or spinning department in the textile factory under his control to exceed the following limits:

I. Dry Bulb Thermometer Readings. Degrees Fahr.	II. Wet Bulb Thermometer Readings. Degrees Fahr.	III. Percentage of Humidity.	I. Dry Bulb Thermometer Readings. Degrees Fahr.	II. Wet Bulb Thermometer Readings. Degrees Fahr.	III. Percentage of Humidity.
60	58	88	78	73.5	77
61	59	88	79	74.5	77.5
62	60	88	80	75.5	77.5
63	61	88	81	76	76
64	62	88	82	76.5	74
65	63	88	83	77.5	74
66	64	88	84	78	72
67	65	88	85	79	72
68	66	88	86	80	72
69	67	88	87	80.5	71
70	68	88	88	81.5	71
71	68.5	85.5	89	82.5	71
72	69	84	90	83	69
73	70	84	91	83.5	68
74	70.5	81.5	92	84.5	68
75	71.5	81.5	93	85.5	68
76	72	79	94	86	66
77	73	79	95	87	66

Section 5. Water used for humidifying purposes in a textile factory shall be taken either from a public supply of drinking water, or from some other source of pure water, or from a supply of water which, although in the opinion of the state board of health not suitable for drinking purposes, is sufficiently free from impurities as not to be dangerous to the health of employees when used for humidifying purposes; and all ducts for the introduction or distribution of humidified air shall be kept clean.

Section 6. This act shall be enforced by the state inspectors of health under the supervision of the state board of health. Whoever fails to comply with the provisions contained herein after being requested so to do by a state inspector of health shall be fined not more than fifty dollars for each offence.

Section 7. To provide for the expenses necessary in carrying out the provisions of this act, in connection with and in addition to the duties provided for by chapter five hundred and thirty-seven of the acts of the year nineteen hundred and seven, there may be expended out of the treasury of the commonwealth annually a sum not exceeding one thousand dollars in addition to the five thousand dollars provided for by section seven of said chapter five hundred and thirty-seven. [*Approved May 23, 1910.*

LICENSING AND REGULATION OF LYING-IN HOSPITALS IN CITIES AND TOWNS.

Acts of 1910, Chapter 569.

An Act to provide for the licensing and regulation of lying-in hospitals in cities and towns.

Be it enacted, etc., as follows:

Chapter seventy-five of the Revised Laws is hereby amended by striking out sections sixty-two, sixty-three and sixty-four, and inserting in place thereof the following: — *Section 62.* The state board of charity may issue a license, subject to revocation by it, to a person whom it deems suitable and responsible to establish or keep for two years within a city or town of this commonwealth, a lying-in hospital, hospital ward or other place for the reception, care and treatment of women in labor, if the local board of health shall first certify to the state board of charity that, from its inspection and examination of such hospital, hospital ward or other place aforesaid, the same is suitable for the said purpose. *Section 63.* The state board of charity shall have supervision of all such hospitals, hospital wards or other places, may make necessary rules for their regulation and may designate its agents to visit and inspect the same. The said hospitals, hospital wards and other places shall also be subject to visitation and inspection at any time by the head of the police department, or his authorized agent, or the board of health of a city, or by the chief of police, selectmen, or the board of health of a town, and if, during the year, it receives more than six patients, by the state board of health. *Section 64.* Whoever establishes or keeps or is concerned in establishing or keeping in a city or town of this commonwealth a hospital, hospital ward or other place for the purpose mentioned in section sixty-two or is engaged in any such business, without such license, shall for the first offence be punished by a fine of not more than five hundred dollars; and for any subsequent offence by imprisonment for not more than two years. [*Approved May 26, 1910.*

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Approved by
The State Board of Publication.

WEEKLY RETURNS OF DEATHS FROM CITIES AND TOWNS OF MORE THAN 10,000 POPULATION.

WEEK ENDING JUNE 4, 1910.

CITIES AND TOWNS.	Population.[1] Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	213	45	65	21	24	1	3	4
Worcester,	136,476	35	10	12	7	3	–	–	–
Fall River,	106,486	53	23	27	12	2	1	1	1
Cambridge,	102,112	28	10	10	5	4	–	–	–
Lowell,	96,380	21	4	7	2	–	–	–	–
New Bedford,	85,516	28	3	10	5	2	–	1	–
Lynn,	84,623	20	4	9	3	6	–	–	–
Springfield,	84,237	20	8	7	4	–	–	1	–
Lawrence,	78,000	21	6	10	3	3	–	–	–
Somerville,	76,049	14	7	3	–	1	1	–	–
Brockton,	55,039	11	0	2	1	1	–	–	–
Holyoke,	53,590	21	13	5	1	1	1	–	–
Malden,	41,941	12	4	5	3	–	1	–	–
Chelsea,	40,080	9	2	3	2	–	–	–	–
Newton,	39,642	8	3	–	–	–	–	–	–
Salem,	39,019	16	4	5	–	3	–	–	–
Haverhill,	38,362	8	3	5	3	1	–	–	–
Fitchburg,	34,263	4	2	1	–	1	–	–	–
Everett,	33,597	5	1	1	1	–	–	–	–
Quincy,	31,937	4	1	3	1	1	–	–	–
Taunton,	30,967	16	4	5	3	1	–	–	–
Waltham,	28,761	3	–	3	1	–	–	–	–
Pittsfield,	27,932	15	4	2	–	1	–	–	–
Brookline,	26,674	4	–	–	–	–	–	–	–
Gloucester,	26,011	3	–	–	–	–	–	–	–
North Adams,	22,150	7	2	2	–	1	1	–	–
Northampton,	21,075	4	0	–	–	–	–	–	–
Chicopee,	21,049	10	6	3	1	–	–	–	–
Medford,	20,921	5	–	1	1	–	–	–	–
Beverly,	16,386	7	1	–	–	–	–	–	–
Leominster,	16,030	3	1	1	1	–	–	–	–
Hyde Park,	15,609	5	1	2	–	2	–	–	–
Melrose,	15,459	3	2	–	–	–	–	–	–
Newburyport,	14,834	2	–	1	1	–	–	–	–
Revere,	14,820	3	3	2	2	–	–	–	–
Westfield,	14,750	8	2	3	1	2	–	–	–
Woburn,	14,522	2	0	–	–	–	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	4	1	2	–	1	–	–	–
Attleborough,	13,913	5	2	–	–	–	–	–	–
Adams,	13,685	1	–	–	–	–	–	–	–
Clinton,	13,105	6	–	1	–	1	–	–	–
Gardner,	13,066	6	2	2	1	1	–	–	–
Milford,	12,722	–	–	–	–	–	–	–	–
Watertown,	12,676	4	1	2	2	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	7	3	3	1	–	–	–	1
Weymouth,	11,798	3	–	1	1	–	–	–	–
Framingham,	11,749	3	0	1	–	1	–	–	–
Wakefield,	11,124	5	2	3	1	1	–	1	–
Webster,	11,109	1	1	–	–	–	–	–	–
Arlington,	10,520	2	–	–	–	–	–	–	–
Greenfield,	10,140	0	–	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,388,979	698	191	230	91	65	6	7	6

[1] The populations were estimated upon the rate of growth from 1900 to 1905. Those of Taunton, Gloucester, North Adams and Clinton were allowed to stand as in 1905, having shown no increase during the five-year period. The gain in the population of Lowell is due to the annexation of a part of the town of Tewksbury. The population of Lawrence by the census of 1905 was 70,050, but, owing to the building of the new Wood and Arlington mills, an increase of about 8,000 is estimated by the Lawrence Board of Health, or 78,000.

WEEK ENDING JUNE 11, 1910.

CITIES AND TOWNS.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	206	51	55	13	19	2	–	3
Worcester,	136,476	38	13	17	10	3	2	–	1
Fall River,	106,486	41	20	20	5	5	–	–	–
Cambridge,	102,112	26	6	11	3	6	–	–	1
Lowell,	96,380	35	12	9	4	1	–	–	1
New Bedford,	85,516	35	18	16	7	1	2	2	–
Lynn,	84,623	23	5	7	3	2	–	2	–
Springfield,	84,237	22	9	5	3	–	1	–	–
Lawrence,	78,000	13	6	4	–	1	–	–	–
Somerville,	76,049	26	4	7	1	4	–	–	–
Brockton,	55,039	16	3	4	2	–	–	–	–
Holyoke,	53,590	17	6	5	3	1	–	–	–
Malden,	41,941	10	2	1	–	–	1	–	–
Chelsea,	40,080	10	1	3	1	1	–	–	–
Newton,	39,642	6	–	–	–	–	–	–	–
Salem,	39,019	9	1	2	–	2	–	–	–
Haverhill,	38,362	18	2	10	3	3	–	2	–
Fitchburg,	34,263	5	0	–	–	–	–	–	–
Everett,	33,597	3	–	–	–	–	–	–	–
Quincy,	31,937	–	–	–	–	–	–	–	–
Taunton,	30,967	14	5	5	2	1	–	–	–
Waltham,	28,761	7	1	–	–	–	–	–	–
Pittsfield,	27,932	12	3	1	–	–	–	–	–
Brookline,	26,674	2	–	–	–	–	–	–	–
Gloucester,	26,011	7	1	–	–	–	–	–	–
North Adams,	22,150	9	3	1	–	1	–	–	–
Northampton,	21,075	2	0	–	–	–	–	–	–
Chicopee,	21,049	5	5	2	2	–	–	–	–
Medford,	20,921	4	1	1	–	–	–	–	–
Beverly,	16,386	2	–	–	–	–	–	–	–
Leominster,	16,030	3	–	1	1	–	–	–	–
Hyde Park,	15,609	3	0	1	1	–	–	–	–
Melrose,	15,459	3	0	–	–	–	–	–	–
Newburyport,	14,834	2	1	1	–	–	–	–	–
Revere,	14,820	4	1	–	–	–	–	–	–
Westfield,	14,750	4	3	2	2	–	–	–	–
Woburn,	14,522	5	–	1	–	1	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	3	0	–	–	–	–	–	–
Attleborough,	13,913	0	–	–	–	–	–	–	–
Adams,	13,685	1	1	–	–	–	–	–	–
Clinton,	13,105	5	2	2	1	1	–	–	–
Gardner,	13,066	3	1	1	1	–	–	–	–
Milford,	12,722	–	–	–	–	–	–	–	–
Watertown,	12,676	2	0	1	–	1	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	1	–	–	–	–	–	–	–
Weymouth,	11,798	2	–	1	–	1	–	–	–
Framingham,	11,749	5	0	1	–	1	–	–	–
Wakefield,	11,124	2	–	1	–	1	–	–	–
Webster,	11,109	5	3	3	1	1	–	–	–
Arlington,	10,520	4	1	1	1	–	–	–	–
Greenfield,	10,140	3	2	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,388,979	683	193	203	70	58	8	6	6

WEEK ENDING JUNE 18, 1910.

CITIES AND TOWNS.	Population Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM — Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	196	47	62	20	24	7	–	–
Worcester,	136,476	47	19	15	4	2	3	–	2
Fall River,	106,486	49	28	28	7	2	–	–	1
Cambridge,	102,112	23	7	11	5	3	–	–	–
Lowell,	96,380	27	9	9	4	1	–	2	–
New Bedford,	85,516	30	20	12	4	1	–	–	1
Lynn,	84,623	22	7	7	2	2	2	–	–
Springfield,	84,237	29	11	12	3	2	1	1	–
Lawrence,	78,000	27	13	7	2	3	1	–	1
Somerville,	76,049	17	2	6	3	1	1	–	–
Brockton,	55,039	11	1	3	1	2	–	–	–
Holyoke,	53,590	19	7	8	5	–	–	–	–
Malden,	41,941	8	2	2	–	–	–	–	–
Chelsea,	40,080	10	2	1	–	–	–	–	–
Newton,	39,642	10	3	3	1	2	–	–	–
Salem,	39,019	7	2	1	–	1	–	–	–
Haverhill,	38,362	12	4	4	2	–	–	–	–
Fitchburg,	34,263	10	3	1	–	1	–	–	–
Everett,	33,597	11	2	3	1	2	–	–	–
Quincy,	31,937	2	–	–	–	–	–	–	–
Taunton,	30,967	12	3	3	–	1	–	1	–
Waltham,	28,761	6	0	1	1	–	–	–	–
Pittsfield,	27,932	15	5	2	1	1	–	–	–
Brookline,	26,674	6	–	–	–	–	–	–	–
Gloucester,	26,011	8	3	1	–	–	1	–	–
North Adams,	22,150	3	1	–	–	–	–	–	–
Northampton,	21,075	4	1	1	–	–	–	–	–
Chicopee,	21,049	4	1	3	–	1	–	–	–
Medford,	20,921	4	1	–	–	–	–	–	–
Beverly,	16,386	6	1	1	–	1	–	–	–
Leominster,	16,030	1	–	–	–	–	–	–	–
Hyde Park,	15,609	4	1	1	–	1	–	–	–
Melrose,	15,459	9	1	1	–	1	–	–	–
Newburyport,	14,834	6	1	–	–	–	–	–	–
Revere,	14,820	5	2	2	1	1	–	–	–
Westfield,	14,750	3	1	–	–	–	–	–	–
Woburn,	14,522	6	2	1	1	–	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	4	2	–	–	–	–	–	–
Attleborough,	13,913	2	0	–	–	–	–	–	–
Adams,	13,685	0	–	–	–	–	–	–	–
Clinton,	13,105	2	–	–	–	–	–	–	–
Gardner,	13,066	4	3	1	–	–	–	–	1
Milford,	12,722	–	–	–	–	–	–	–	–
Watertown,	12,676	1	0	–	–	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	1	1	1	1	–	–	–	–
Weymouth,	11,798	2	–	1	–	–	–	–	–
Framingham,	11,749	4	0	–	–	–	–	–	–
Wakefield,	11,124	4	1	2	–	–	–	–	–
Webster,	11,109	4	3	2	1	–	1	–	–
Arlington,	10,520	2	–	–	–	–	–	–	–
Greenfield,	10,140	1	1	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,388,979	700	224	219	70	56	17	4	6

WEEK ENDING JUNE 25, 1910.

CITIES AND TOWNS.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	178	56	62	17	24	1	–	3
Worcester,	136,476	38	10	4	1	–	–	–	–
Fall River,	106,486	46	30	33	10	1	–	–	–
Cambridge,	102,112	23	4	11	4	3	1	1	–
Lowell,	96,380	40	15	12	5	1	–	1	–
New Bedford,	85,516	36	25	3	1	1	–	1	–
Lynn,	84,623	31	7	4	1	1	1	–	–
Springfield,	84,237	35	16	18	4	1	–	–	–
Lawrence,	78,000	29	12	12	1	4	–	–	–
Somerville,	76,049	13	3	4	4	–	–	–	–
Brockton,	55,039	11	0	2	–	2	–	–	–
Holyoke,	53,590	27	8	11	2	1	–	3	1
Malden,	41,941	10	1	2	–	–	–	–	–
Chelsea,	40,080	6	2	1	1	–	–	–	–
Newton,	39,642	7	2	–	–	–	–	–	–
Salem,	39,019	5	2	–	–	–	–	–	–
Haverhill,	38,362	13	2	4	3	–	–	1	–
Fitchburg,	34,263	1	1	–	–	–	–	–	–
Everett,	33,597	2	1	–	–	–	–	–	–
Quincy,	31,937	8	–	2	–	2	–	–	–
Taunton,	30,967	12	3	2	–	1	–	–	–
Waltham,	28,761	1	1	–	–	–	–	–	–
Pittsfield,	27,932	16	6	7	2	1	1	–	–
Brookline,	26,674	7	1	1	–	–	–	–	–
Gloucester,	26,011	7	–	–	–	–	–	–	–
North Adams,	22,150	6	2	1	1	–	–	–	–
Northampton,	21,075	8	1	–	–	–	–	–	–
Chicopee,	21,049	4	3	2	–	–	–	–	–
Medford,	20,921	3	1	–	–	–	–	–	–
Beverly,	16,386	6	–	–	–	–	–	–	–
Leominster,	16,030	1	–	–	–	–	–	–	–
Hyde Park,	15,609	2	1	1	–	–	–	–	1
Melrose,	15,459	3	1	1	–	–	–	–	–
Newburyport,	14,834	5	–	2	1	–	–	–	–
Revere,	14,820	9	2	2	1	–	–	–	–
Westfield,	14,750	5	1	2	–	2	–	–	–
Woburn,	14,522	1	0	1	–	–	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	4	1	–	–	–	–	–	–
Attleborough,	13,913	3	0	–	–	–	–	–	–
Adams,	13,685	2	1	1	–	–	–	–	1
Clinton,	13,105	1	0	1	–	–	–	1	–
Gardner,	13,066	5	1	–	–	–	–	–	–
Milford,	12,722	–	–	–	–	–	–	–	–
Watertown,	12,676	3	1	1	–	–	–	–	1
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	7	2	1	–	1	–	–	–
Weymouth,	11,798	6	–	1	–	–	–	–	–
Framingham,	11,749	2	1	–	–	–	–	–	–
Wakefield,	11,124	1	–	–	–	–	–	–	–
Webster,	11,109	3	2	1	1	–	–	–	–
Arlington,	10,520	1	–	1	1	–	–	–	–
Greenfield,	10,140	3	1	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,388,979	676	232	212	63	44	4	8	7

WEEKLY RETURNS OF DEATHS FROM CERTAIN INFECTIOUS DISEASES.

DEATHS FROM INFECTIOUS DISEASES NOT SPECIFICALLY MENTIONED IN ABOVE TABLES DURING THE WEEKS OF JUNE 4, 11, 18 AND 25, 1910.

DISEASE.	Place.	WEEK ENDING—			
		June 4.	June 11.	June 18.	June 25.
Cerebro-spinal meningitis,	Boston,	–	–	–	1
	Brockton,	–	1	–	–
	Haverhill,	–	1	–	–
	Holyoke,	–	–	1	–
	Malden,	–	–	2	–
	New Bedford,	–	–	1	–
	Pittsfield,	–	–	–	1
	Worcester,	–	–	2	–
Scarlet fever,	Boston,	2	–	2	1
	Chicopee,	–	–	1	–
	Lawrence,	–	–	–	1
	Lowell,	5	–	2	2
	Lynn,	–	–	–	1
	Medford,	–	1	–	–
	Northampton,	–	–	1	–
	Pittsfield,	–	1	–	–
	Southbridge,	1	–	–	–
	Springfield,	–	–	2	–
	Revere,	–	–	–	1
	Wakefield,	–	–	2	–
Whooping cough,	Boston,	1	–	2	1
	Cambridge,	–	–	–	1
	Lynn,	–	–	1	–
	Pittsfield,	–	–	–	1
	Springfield,	1	–	–	1
Erysipelas,	Boston,	1	1	2	–
	Holyoke,	1	–	–	–
	New Bedford,	–	–	1	–
	Somerville,	–	–	1	–
	Taunton,	1	–	–	–
Tuberculosis, other than pulmonary.	Boston,	3	5	4	4
	Chelsea,	1	1	1	–
	Chicopee,	2	–	–	–
	Haverhill,	–	–	2	–
	Lawrence,	–	–	–	1
	Malden,	–	–	–	2
	Marlborough,	1	–	–	–
	New Bedford,	–	1	–	–
	Newburyport,	–	1	–	1
	Pittsfield,	1	–	–	1
	Quincy,	1	–	–	–

DEATHS FROM INFECTIOUS DISEASES, ETC. — *Concluded.*

DISEASE.	Place.	WEEK ENDING— June 4.	June 11.	June 18.	June 25.
Tuberculosis other than pulmonary — *Con.*	Salem,	2	–	–	–
	Somerville,	1	1	–	–
	Webster,	–	1	–	–
	Weymouth,	–	–	1	1
	Woburn,	–	–	–	1
	Worcester,	1	–	1	2
Meningitis other than cerebro-spinal.	Brockton	–	1	–	–
	Waltham,	2	–	–	–
Tetanus,	Everett,	–	–	–	1

WEEKLY RETURNS OF CASES OF INFECTIOUS DISEASES.

CASES OF INFECTIOUS DISEASES REPORTED DURING THE WEEKS OF JUNE 4, 11, 18 AND 25, 1910.

[Under the provisions of section 52 of chapter 75 of the Revised Laws.]

	WEEK ENDING— June 4.	June 11.	June 18.	June 25.	Total.
Diphtheria,	142	137	130	123	532
Measles,	624	577	509	471	2,181
Scarlet fever,	155	172	141	126	594
Typhoid fever,	45	30	29	40	144
Tuberculosis, pulmonary,	146	172	141	224	683
Tuberculosis other than pulmonary,	1	2	1	3	7
Cerebro-spinal meningitis,	2	5	5	3	15
Meningitis other than cerebro-spinal,	–	–	1	–	1
Whooping cough,	22	24	23	26	95
Varicella,	59	40	37	29	165
Erysipelas,[1]	–	1	–	–	1
Mumps,[1]	–	1	–	2	3
Ophthalmia neonatorum,	2	2	10	8	22
Smallpox,	–	3	4	–	7
Anterior poliomyelitis,	2	4	2	9	17
Malaria,	–	–	2	–	2
Tetanus,	2	1	2	2	7

[1] Erysipelas and mumps are not diseases notifiable under section 52 of chapter 75 of the Revised Laws. The figures concerning these diseases are, therefore, incomplete.

MONTHLY REPORT ON INSPECTION OF FOOD AND DRUGS.

The following summary presents the results of the examination of food and drugs made by the State Board of Health during the month of June, 1910: —

Articles examined.	Number found to be of Good Quality.	Number adulterated or varying from the Legal Standard.	Total.	Articles examined.	Number found to be of Good Quality.	Number adulterated or varying from the Legal Standard.	Total.
Butter,	5	–	5	Maple sugar,	2	–	2
Canned fruit and vegetables,	4	–	4	Meat products: —			
Cider,	1	–	1	Sausages,	4	4	8
Cocoa,	2	–	2	Tripe,	1	–	1
Condensed milk,	5	–	5	Mustard,	1	–	1
Confectionery,	2	–	2	Non-alcoholic drinks,	1	–	1
Cream,	2	–	2	Olive oil,	5	1	6
Drugs,	49	7	56	Proprietary foods,	3	–	3
Flavoring extracts,	5	–	5	Syrup,	1	–	1
Grape juice,	2	–	2	Vinegar,	1	–	1
Horse-radish	1	–	1				
Jams and jellies,	4	1	5	Total,	475	70	545
Milk,	374	57	431				

The samples of drugs found to be adulterated were: gin, camphor liniment, spirit of anise and tincture of iodine.

The cities and towns in which samples were collected were: Acton, Beverly, Boston, Cambridge, Canton, Chelsea, Fall River, Fitchburg, Hopedale, Ipswich, Lawrence, Leominster, Lynn, Marblehead, Marlborough, Melrose, Mendon, Medford, Milford, Needham, New Bedford, Newton, Newburyport, Peabody, Pittsfield, Plymouth, Revere, Salem, Somerville, Taunton, Winthrop and Worcester.

PROSECUTIONS FOR VIOLATIONS OF THE LAW RELATING TO FOOD AND DRUGS.

Nine convictions were secured during the month of June, 1910, for selling adulterated food and drugs, as follows: —

No.	Name of Defendant.	Place.	Character of Article sold.
1	H. P. Hood & Sons,	Lynn,	Milk (total solids, 11.74).
2	H. P. Hood & Sons,	Lynn,	Milk (total solids, 11 80).
3	Herbert H. Pope,	Marblehead,	Milk (total solids, 10.02).[1]
4	Herbert H. Pope,	Marblehead,	Milk (total solids, 12.08).
5	Henry Rich,	Milford,	Milk (total solids, 10.40).
6	Harvey S. Smith,	Pittsfield,	Milk (total solids, 11.0).[1]
7	L. Almon Johnson,	Boston,	Sausages.
8	Edward F. Fahey,	Pittsfield,	Spirit of anise.
9	Thomas H. Farrell,	Pittsfield,	Spirit of anise.

[1] Watered.

Fines imposed, $227.75.

LIST OF ADULTERATED OR IMPROPERLY LABELLED FOODS, ETC., FOR JUNE, 1910.

Number of Sample.	Character of Sample.	Name of Manufacturer, Wholesaler or Producer.	Results of Analyses.
12375	"White Swan" Maraschino cherries.	The Mihalovitch-Fletcher Company, Cincinnati, O.,	Preserved with benzoic acid; percentage of preservative not stated.
12315	Pure Italian olive oil,	Olio D'Oliva Sopraffino "Lucca Mulino" brand,	Contained cotton seed oil.
12378	"Empire" apple and honey.	G. F. Coshland & Co., New York,	Contained 37 per cent. alcohol.
5486 N	Camphorated oil,	Choate Drug and Chemical Company, Boston, Mass.,	65 per cent. U. S. P. strength.
5472 N	Camphorated oil,	Markell Drug Company, Boston, Mass.,	72 per cent. U. S. P. strength.
5470 N	Tincture of iodine,	Markell Drug Company, Boston, Mass.,	50 per cent. U. S. P. strength.
q 5079	Milk,	P. A. Green, Milford, Mass.,	Total solids, 9.46 per cent.; fat, 3.20 per cent.; contained added water.
q 5084	Milk,	W. I. Beal, Milford, Mass.,	Total solids, 11.46 per cent.; fat, 3.40 per cent.; contained added water.
q 5097	Milk,	P. A. Green, Milford, Mass.,	Total solids, 6.90 per cent.; fat, 2 20 per cent.; contained added water.
q 5098			Total solids, 8.10 per cent.; fat, 2.80 per cent.; contained added water.
q 5102	Milk,	Geo. H. Doe, Milford, Mass.,	Total solids, 10.50 per cent.; fat, 3.60 per cent.; contained added water.
q 5103			Total solids, 9.70 per cent.; fat, 3.30 per cent.; contained added water.
12452	Milk,	Frank Saunders, Tiverton, R. I.,	Total solids, 11.34 per cent.; fat, 4.00 per cent.; contained added water.

LIST OF ADULTERATED OR IMPROPERLY LABELLED FOODS, ETC. — *Concluded.*

Number of Sample.	Character of Sample.	Name of Manufacturer, Wholesaler or Producer.	Results of Analyses.
q 5109	Milk,	John E. Willard, Fitchburg, Mass.,	Total solids, 10.75 per cent.; fat, 3.30 per cent.; contained added water.
q 5115	Milk,	John E. Willard, Fitchburg, Mass.,	Total solids, 11.36 per cent.; fat, 3.50 per cent.; contained added water.
q 5117	Milk,	John E. Willard, Fitchburg, Mass.,	Total solids, 10.78 per cent.; fat, 3.30 per cent.; contained added water.
q 5119	Milk,	John E. Willard, Fitchburg, Mass.,	Total solids, 11 08 per cent.; fat, 3.35 per cent.; contained added water.
q 5141	Milk,	Herbert P. Pomeroy, South Framingham, Mass.,	Total solids, 11.36 per cent.; fat, 3.30 per cent.; contained added water.
12393	Milk,	Herbert H. Pope, Marblehead, Mass.,	Total solids, 10.02 per cent.; fat, 1.60 per cent.; proteids, 2.93 per cent.; skimmed milk.
12262	Milk,	J. Carvin, Chelsea, Mass.,	Total solids, 11.40 per cent.; fat, 2.40 per cent.; proteids, 3.24 per cent.; skimmed milk.
12362	Milk,	J. J. Whitaker, Medford, Mass.,	Total solids, 10.50 per cent.; fat, 1 80 per cent.; skimmed milk.

INSPECTION OF DAIRIES.

During the month of June, 1910, 195 dairies were examined in the following places: —

Place.	Number examined.	Number found to present no Objectionable Features.	Per Cent.	Number concerning which Letters were sent.	Per Cent.
Amesbury,	10	5	50.00	5	50.00
Second inspection,	17	12	70.59	5	29.41
Groveland,	–	–	–	–	–
Second inspection,	7	4	57.14	3	42.86
Third inspection,	1	1	100.00	–	–
Merrimac,	–	–	–	–	–
Second inspection,	14	6	42.86	8	57.14
Newbury,	6	2	33.33	4	66.67
Second inspection,	28	15	53.57	13	46.43
Newburyport,	5	2	40.00	3	60.00
Second inspection,	19	7	36.84	12	63.16
Rowley,	1	1	100.00	–	–
Second inspection,	22	11	50.00	11	50.00
Salisbury,	3	3	100.00	–	–
Second inspection,	22	13	59.09	9	40.91
West Newbury,	1	–	–	1	100.00
Second inspection,	39	23	58.97	16	41.03

Total number of dairies examined,	195
Number found to be free from objectionable conditions,	105
Number concerning which letters were sent,	90
Total number of conditions to which attention was called,	262
Percentage of dairies which passed inspection,	53.85

In addition to the above, 93 dairies were visited at which the sale of milk has been discontinued.

The names of the owners of the dairies found to be worthy of commendation follow: —

Amesbury.

Class A.

Chesley, M. Berry*†
Little, J. P.*†
Merrill, Albert*†
Wilson, H. I.*†

Class B.

Barnard, George
Bartlett, Theo.*†
Bean, Oscar
Blakie Bros.*
Collins, S. J.*†
Davis, Alfred W.*
Davis, J. A.*†
Mahoney, John*†
Smith, C. F.
True, Eben*†
True, Estate of John S.
True, William*
Worthen, William E.

Groveland.

Class B.

Carter, Jonathan E. Jr.‡
Day, Randall B.*†
Groveland Town Farm*
Longfellow, Nathan*
Snell, Thomas*†

* Second inspection. † Reported favorably on first inspection. ‡ Third inspection.

Merrimac.

Class B.

Hoyt, Charles E.*
Kenison, Albert E.*†
Little, E. C.*†
Sargent, J. H.*†
Walker, H. A.*
Witham, C. C.*

Newbury.

Class A.

Evans, William D.
Illsley, Paul*†
Little, E. F. & D. N.*†
Little, Stephen W.*
Little, William Burke*
Noyes, James*

Class B.

Adams, Frank W.*
Bray, George W.*
Brown, C.
Illsley, Edwin*
Jacques, Richard*
Kent, Edward*†
Knight, W. C.*
Little, Heber*
Perkins, Frank*
Plummer, Warren*
Rolfe, J. C.*

Newburyport.

Class A.

Bartlett, Charles S.* †
Norris, R. S.*
Underhill, F. M.*
Winder, C. B. & N R.*

Class B.

Fowle, Raymond
Kelleher, Michael
Knight, Joseph D.*
Lyons, James *
Winkley, J. Otis *

Rowley.

Class A.

Todd, Frank * †

Class B.

Bradstreet, Mrs. D. W.*
Dole, C. L.* †
Dresser, Charles * †
Edgerly, C. R.*
Foss, Estate of B. W.* †
Gordon, W. K.*
Mighill, Charles P.* †
Millett, A. L.*
Stewart, J. C.*
Tenney, S. P. & J. H.
Williams, John *

Salisbury.

Class B.

Bartlett, A. W.* †
Brewster, Charles*
Cole, Charles
Dow, G. A.* †
French, Alvin W.*
Houghton, J. Henry *
Lake, Nicholas P.*
Larnard, John *
Penniman, George
Pike, Charles J.* †
Pike, George * †
Pike, Wilbur *
True, Alston *
True, Henry O.
True, Israel *
True, Prince Albert *

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* Second inspection. † Reported favorably on first inspection.

West Newbury.

Class A.

Bailey, Lawrence *
Goodrich & Currier * †
Ordway, Charles W.*
Ordway, Samuel O.*

Class B.

Bartlett, Edgar *
Brown, Robert S.*
Colcord, G. O.*
Colcord, H. H.*
Evans, David H.*
Goodrich, Granville *
Hills, William *
Knapp, Adelbert *
McDonald Bros. (Dairy No. 1)*
McDonald Bros. (Dairy No. 2)*
Ordway, Cyrus *
Pinkham George B.* †
Poore, Fred H.*
Poore, P. A.*
Poore, W. S.* †
Rogers, C. H.*
Rogers, G. C.*
Solking, Edward *
Swapp, J. F.*

THE OCCURRENCE OF INFANTILE PARALYSIS IN MASSACHUSETTS IN 1909.[1]

Reported for the Massachusetts State Board of Health by Robert W. Lovett, M.D., Boston.

The medical profession of to-day is confronted with the task of constructing a new literature on the subject of infantile paralysis. What was written five years ago is to-day largely out of date, and the standard text-books cannot naturally present the latest point of view so rapid has been the recent progress of our knowledge in regard to this disease. The chief contributors to this rapid advance have been, first and foremost, Flexner and Lewis in demonstrating the etiology, Wickman, of Sweden, in giving us a new symptomatology and defining types not before recognized, and Harbitz and Scheele, of Norway, in formulating the pathology.

The present paper will consist, first, of a condensed report of the recent progress of our knowledge with regard to the disease, and, secondly, of the data obtained with regard to the disease in this State in 1909 by the State Board of Health.

I. REPORT OF PROGRESS.

The most important step in our knowledge of the disease consists in the establishment during the past year of its infectious character by several observers. With the ability to produce the disease in monkeys by inoculation, there has been given the opportunity to study its etiology, symptoms and pathology, which opportunity did not exist before.

* Second inspection. † Reported favorably on first inspection.

1 Portions of this report were read in abstract before a joint session of the American Orthopedic and Pediatric Societies in Washington on May 4, 1910, and before the Massachusetts Medical Society in Boston, June 8, 1910. Reprinted from the "Boston Medical and Surgical Journal," July 14, 1910

Experimental Production.

Infantile paralysis has been recently shown to be an infectious disease, caused by a living organism so small that it can pass through the finest bacterial filter. It is invisible to the microscope and the ultramicroscope.[17] This places the disease in a class with those caused by a filterable virus, similar diseases of this class being yellow fever, foot and mouth disease, pleuro-pheumonia of cattle, etc. It can be caused in monkeys by inoculation with an emulsion of certain tissues from a human being dying of the disease, and from affected monkeys.[41, 17, 10, 30, 50]

The virus is contained in the brain and spinal cord, the mucous membrane of the nasopharynx, infected lymphatic glands, in the salivary glands,[10] and, in the acute stage, in the blood and cerebro-spinal fluid.[17]

The disease may be caused by inoculation by the following routes: intracerebral, subdural, intraneural and perineural, intraperitoneal, subcutaneous, by the circulation, and by implantation in the anterior chamber of the eye.[10, 17, 41]

By the digestive route it has been caused by introducing an emulsion into the stomach by means of a catheter and by introduction of the virus into intestines paralyzed by opium.[41]

By the respiratory route the disease has been caused by rubbing the nasal mucous membrane after scarification[17] with a virulent suspension, by the same procedure without scarification, by inhalation of a virulent emulsion, and by implantation of infected tissue in the trachea.[41]

The fact that the disease may be caused by virus entering both respiratory and digestive tracts must be remembered when we come to inquire how the virus enters the human body.

Inoculations into horses, calves, goats, pigs, sheep, rats, cats, mice,[30] rabbits,[39] chickens,[42] guinea pigs[30] and dogs have proved negative except for the results of Krause and Meinicke,[24] who caused paralysis in rabbits by inoculation with virulent material, but their results are not generally accepted by other observers as they are in contradiction to practically all other experimental work and not sufficiently supported by pathological evidence.

The virulence of an emulsion is not impaired by drying for seven days, by freezing nor by suspension in glycerine,[10, 17, 30] but is injured by a temperature of 45° to 50° C.[17] The virus is not always affected by dilution, a solution of one to a thousand working as quickly and effectually as the full strength.[41]

The stage of incubation in monkeys is from six to upwards of thirty days, and the long incubation period in monkeys suggests the possibility that in the human being some of the late fall and early winter

cases may have acquired their infection when the disease was prevalent in August and September. The ordinary incubation period in human beings is not known. It is generally stated as from one to fourteen days.

Immunity.

One attack of the disease apparently confers immunity to future attacks.[17, 10, 31, 41] This is the accepted clinical history in human beings, and has been found to be the case in monkeys inoculated experimentally.

Active immunization in monkeys has been secured by the repeated injection of small doses of virus, after which a full dose has had no effect.[17]

Passive serum protection has been obtained by mixing with an active dose of the virus an equal amount of the blood serum of a recovered monkey, which neutralizes the effect of the virus, and in the same way the blood serum of children who have recovered, when mixed with the virus in proper proportions, neutralizes its effect.[17] Attempts to secure a neutralizing serum from horses who have received repeated injections of virus have not been successful. Even if we had at hand a therapeutic serum for this disease, it must be evident that such a serum to be of use must be used early in the disease, and at present our diagnostic knowledge is not sufficient to enable us to use it before the destruction occurs in the cord. The diagnosis is now rarely made before the paralysis occurs, and a better knowledge of the early symptoms and diagnostic signs of the disease is one of our most urgent needs, and indicates the line in which our investigation for the present year should progress.

Diagnosis.

In the matter of clinical diagnosis, the last year has added a little to our knowledge, chiefly in the way of a better knowledge of early symptoms. The eight types of the disease as described by Wickman are not, however, sufficiently known in the English language, and a translation of his book would be of great value (Wickman: Beiträge zur Kenntniss der Heine Medinschen Krankheit, Berlin, 1907), although a short abstract has been made of it.[18]

Müller,[33] investigating, at the request of the authorities, an epidemic in Westphalia in 1909, considered three symptoms of great importance in the early stages. These were (1) tendency to profuse sweating, (2) hyperesthesia and sensitiveness to movements, and (3) leucopenia. Respiratory and digestive symptoms were common in the earlier stages, and the incubation period was at least five days.

Krause[23] was commissioned by the government, in 1909, to investigate an epidemic, consisting of 436 cases, occurring in Germany in the

neighborhood of Hagen. He found digestive symptoms present in 90 per cent. of all cases at the onset, and occasionally respiratory symptoms. He calls especial attention to the importance of sweating and tenderness as early symptoms.

The later laboratory findings suggest that certain characteristics of the blood and cerebro-spinal fluid in the stage preceding paraylsis may enable us to make an earlier and surer diagnosis, but these findings have not yet appeared in print.

Increasing Frequency of Occurrence.

It is generally believed that infantile paralysis is becoming more common and more widespread of late years, but one must bear in mind that there is a possibility that this is because the disease is better known and more frequently recognized. As this is a matter of importance, it seems proper to examine the evidence on this point.

The recognition of outbreaks of infantile paralysis is of comparatively recent date. Bergenholz, a Swede, writing in 1881, is generally credited with having been the first to recognize and describe such an outbreak with sufficient accuracy to make it acceptable. Since that time outbreaks have been reported with increasing frequency. From the time of the first generally accepted outbreak until the close of 1909 is, roughly, thirty years. If this interval be subdivided into periods of five years, beginning with 1880–84 inclusive and ending with 1905–09 inclusive, and if we set down in each period the number of outbreaks reported, we have the following table: —

Period.	Cases.	Outbreaks.	Average Number of Cases.
1880–84,	23	2	11.5
1885–89,	93	7	13.0
1890–94,	151	4	38.0
1895–99,	345	23	15.0
1900–04,	349	9	39.0
1905–09,	8,054	25	322.0

Distribution of Outbreaks.

The recent outbreaks have been widely distributed. From Norway and Sweden have been reported large and carefully studied epidemics, especially in the last ten years. Zappert,[46] in 1908 and 1909, collected 266 cases in Vienna and lower Austria, and Ghon noted many cases in upper Austria (Styria and Carinthia). In Germany, in 1909, the disease was very prevalent. The Westphalia epidemic of 436 cases [23] has been spoken of above. In Rhenish Prussia there were said to have been about 100 cases, and around Marburg about 50. There were cases

in the province of Hanover and about 50 cases in Silesia. Numerous small epidemics were reported. It is estimated that there must have been over 1,000 cases in Germany in 1909.[47] In Holland, 24 cases were reported from Leyden, and others between August and October in other parts of the country.[47]

England seems to have been comparatively immune, and only a small epidemic of 8 cases was reported from Spain. Although no large epidemic occurred in France, there was a consensus of opinion among the medical men quoted by Netter that an unusually large number of cases of infantile paralysis had been seen in 1909.[47, 49]

The United States suffered severely. Minnesota[48] had several hundred cases; Nebraska,[36] 619; Kansas, about 80; and Massachusetts, nearly 1,000.

The report[51] of the New York epidemic of 1907 has just become available for study. The fact that this epidemic of 2,500 cases was the largest ever reported, the painstaking character of the work done and the scientific standing of the committee in charge of the investigation make the report of the greatest importance and value. It is impossible in this place to abstract so condensed and exhaustive a work.

A most interesting and important epidemic of 140 cases has been reported as occurring in 1909 in the Province of Santa Clara, in Cuba.[53] Previous epidemics have been reported from the temperate zones of the north and south hemispheres, chiefly in the northern parts of the former. The Cuban epidemic, as the first reported from the tropics, possesses peculiar interest as to season, distribution, etc. Apparently the disease did not exist in Cuba prior to 1907. In 1907 and 1908 one or two suspicious or authenticated cases appeared in the neighborhood of Havana, the disease becoming epidemic in the Province of Santa Clara in 1909. A survey of the field makes it seem very probable that the disease was imported from New York as a result of the 1907 epidemic there, and that certain unknown determining conditions made the Province of Santa Clara susceptible to a severe outbreak. As in the temperate zones, the disease occurred during the summer, reaching its maximum in July and August. The chief incidence was between the ages of one and three; males were predominantly affected; and the black race was evidently much less affected than the white, in 72 cases the proportion being: whites, 60; mixed race, 4; negroes, 8. The mortality rate was 7.89 per cent.

The time has gone by when the routine reports of epidemics is of any especial value, nor is the exact tabulation of numbers of epidemics of any particular use except as throwing light on the general distribution of the disease, and possibly in this way defining some of its characteristics.

The disease is manifestly prevalent, and it is widespread and increasing. Useful work in the future will consist in the exact and careful house-to-house study of epidemics, both large and small.

Of the 8,054 cases reported in the last five years (number, of course, only approximately correct), the United States contributed 5,514 cases, or about five-sevenths of the total number of cases. The bulk of these cases has, moreover, been reported from the northern States, the outbreaks in the southern States being insignificant. In the same way in Europe, Norway and Sweden contributed about 1,500 cases and Germany practically the rest, except for an outbreak in Australia, which occurred in March, which is their early fall.

As the literature has been very carefully gone over, and as, in the present state of interest in the subject, it seems fair to assume that large outbreaks in any civilized country have been reported, it would seem that the following conclusions were justified: —

1. That outbreaks of infantile paralysis have very greatly increased in several parts of the world in the last five years in a measure not to be explained in any way by the increased interest in the disease.

2. That it is more prevalent in cold than in warm countries.

3. That from the northern part of the United States have been reported more cases than from any part of the world.

The study of these 70 outbreaks, reaching over a period of thirty years, has led, of course, to the knowledge of certain facts with regard to the disease, but they have not given us the essential facts as to how the disease enters the body nor how to prevent or check its spread.

Relation to Influenza.

A recent book[52] deals with the theory that the disease is merely a form of influenza, a contention already discussed prior to 1905 and antagonized by Wickman. The book in question deals with a study of 303 cases occurring in Sweden, each case being considered by itself. The point of view of the author is shown in the following quotation: "I must, therefore, regard this (the intermittent type of influenza) as a very certain proof for my view, acquired on other grounds, that acute infantile paralysis is a nervous form of influenza." Recent progress in the epidemiology of infantile paralysis makes this view seem improbable.

Transmissibility.

In the writings of the last year there is no dissent from the opinion that the disease is communicable. Direct transmission is apparently frequent, transmission by means of a healthy carrier is more than prob-

able, and infection occasionally appears to remain in a house where the disease had previously occurred.

On the other hand, the disease is evidently not very "contagious" in the ordinary acceptance of the term. In the epidemic in the Deerfield valley, in Massachusetts, in 1908, so carefully studied by Emerson,[2] there were 67 cases. There were 166 other children in the families of those affected, and 86 other children known to be in intimate contact with the 67. Of the 252, 4 later developed the disease.

Hill,[48] of the State Board of Health of Minnesota, has contributed a careful study of the transmissibility of the disease, written in a spirit of scientific skepticism. Of 161 cases reported as anterior poliomyelitis, he accepted only 85 as surely valid, and analyzed 81 of these, occurring in 69 families. Sixty-nine of these cases were primary and 12 occurred secondarily in the same families. The secondary cases thus were 17 per cent. of the primary. Contrasting this with the records of other infectious diseases in the same State, the percentage of secondary cases to primary was as follows: —

	Per Cent.
Scarlet fever,	40
Typhoid fever, about	30
Diphtheria,	29
Anterior poliomyelitis,	17

Of persons known to have been exposed to diphtheria, scarlet fever and anterior poliomyelitis, the percentage contracting the disease was as follows: —

	Per Cent.
Scarlet fever,	22
Diphtheria,	17
Anterior poliomyelitis,	6

The disease is thus apparently less readily transmissible than the diseases mentioned in persons exposed, but such figures cannot be considered representative until the abortive cases are included.

The study of the epidemiology of a disease falls into two parts, — the study in the laboratory and the study in the field. The most notable contribution as yet to our knowledge of this disease is from the laboratory, where Flexner and Lewis have established its infectious nature. This fact has narrowed the field of our inquiry and enables us to pursue a more definite and promising scheme, but one should remember that work in the field, comparatively fruitless as it has so far been, holds its place. We knew for many years the organism of malaria and the pathological changes occurring in the disease, but we could not control malaria

until we found that it entered the body through the agency of the mosquito. So it is quite possible to us to know much of the bacteriology and pathology of a disease from the laboratory without being able to control or suppress it, and such knowledge must be supplemented by field work; that is, a study of external conditions to round out our investigation and to make it as effective as we should wish.

II. INFANTILE PARALYSIS IN MASSACHUSETTS IN 1909.

In the year 1909, Massachusetts suffered as much from the disease as any country in Europe; as many cases were reported here as in the two other most severely affected States in the Union — Nebraska and Minnesota — taken together.

In Massachusetts, in 1907, we had begun the investigation of the disease by sending out inquiry blanks to be filled in by the general practitioner. That resulted in a loose collection of 234 cases, the results of which were published.[1] In 1908, half of our 136 cases occurring in the State were located in Franklin County, and these 67 cases were thoroughly studied by Emerson, who lived in the district a month for the purpose. These studies were published.[2]

In 1909 it was decided to take up the matter more seriously. A special agent, Mr. Sheppard, a fourth-year student at the Harvard Medical School, was detailed as a special investigator, and in February, 1910, another special investigator was added to the staff in the person of Dr. Hennelly, a recent graduate of the Harvard Medical School and of the Boston City Hospital. It was thought desirable to have expert advice in conducting the inquiry, and three gentlemen were requested to act as an advisory committee to the Board. These were Dr. Theobald Smith, professor of comparative pathology; Dr. M. J. Rosenau, professor of preventive medicine and hygiene, and Dr. J. H. Wright, pathologist to the Massachusetts General Hospital and assistant professor of pathology, all of the Harvard Medical School. The secretary of the Board, Dr. Mark W. Richardson, has given freely of his time and effort in conducting the details of the inquiry. This advisory committee has met the members of the Board who are concerned in the inquiry at frequent conferences, studied the reports submitted and advised as to the most promising lines of investigation.

The two investigators have conducted a house-to-house investigation and have filled out their own blanks; they have been instructed to work in all cases through the family physician; they have obtained from the family a careful history of the attack and they have examined the affected children. It has not been possible under these conditions to make rapid progress, and at this time only 150 cases have been thus carefully studied.

It seemed to us better to confine the investigation to certain localities, making it exhaustive in certain affected districts in the neighborhood of Boston, rather than to take up a scattered investigation throughout the State. Up to this time the expense of the inquiry had been borne by the Board out of its regular appropriation, but in January, 1910, the Board asked the Legislature for a special appropriation of $5,000 to enable the Board to make a proper and adequate inquiry into this disease as it occurred in the State in 1910. This sum of money was voted without question or opposition. It is our purpose to have on hand a sufficient number of investigators during the coming summer to be able to look into the surroundings of every case within forty-eight hours of the time when the case is reported.

In presenting for the Board some of the results obtained in 1909, it is only proper to say that in the present state of our knowledge no one can say which data are relevant and important and which are not. It is possible that certain facts which now seem of no importance may be of assistance to some future investigator. So far as practicable, our data are presented in graphic form. There are three classes of cases dealt with in this report: (*a*) the total number reported (923); (*b*) the number in which blanks were filled out (628); (*c*) the number thoroughly studied (150). All three classes are utilized in different tables, some being available for one purpose and some for another.

Distribution in the State.

A consideration of the distribution of the disease in the State of Massachusetts for the past three years shows that in all three years the disease occurred in scattered foci in all parts of the State, but was more frequent in the river valleys than away from rivers; that a case rarely occurred in a town without one or more cases in contiguous towns, and that localities severely affected one year were lightly affected the next; *e.g.,* the outbreak in the upper Connecticut valley in 1908 was followed by very few cases in 1909 in that region. In the next year but one, however, localities markedly affected may again show many cases; *e.g.,* in 1907 the extreme western end of the State showed many cases, in 1908 almost none, and in 1909 again many cases. The metropolitan district shows, of course, a large number of cases, and it will be noted that in general there were more cases of the disease in the towns north of Boston than in towns south of it.

Distribution in Boston.

Analyzing the relative prevalence of the disease in the different parts of Boston, the distribution of the cases shows nothing. The incidence was greatest in Dorchester, which is on the shore and not altogether thickly settled; next, in Charlestown, on the shore and densely populated; next, in the city proper, densely settled; and so on, districts on the shore and inland alternating, and density of population having apparently no influence.

	Population, 1905.	Number of Cases.	Incidence per Thousand.
Dorchester,	93,771	76	.81
Charlestown,	39,983	24	.60
Boston, city proper,	159,512	86	.54
Roxbury, West Roxbury and Jamaica Plain,	161,097	67	.42
Brighton,	21,806	9	.41
East Boston,	51,334	20	.39
South Boston,	67,877	17	.25
	595,380	299	.50

Relative Distribution in Cities and Towns.

There are 354 cities and towns in Massachusetts, in 136 of which there occurred cases of infantile paralysis in 1909. These 136 cities and towns were listed according to the prevalence of the disease in each per 1,000 of the inhabitants. The incidence ran from 526 per 100,000 inhabitants to 15 in 100,000. Taking the first 25, where the incidence per 1,000 was highest, the average population was 3,295, and only 4 towns were over 7,000. Taking the last 25 on the list, where the incidence per 1,000 was least, the average population was 34,860, and no city or town was under 7,000 in population. Therefore, in 1909 the disease was relatively much more prevalent in small towns than in the cities and larger towns.

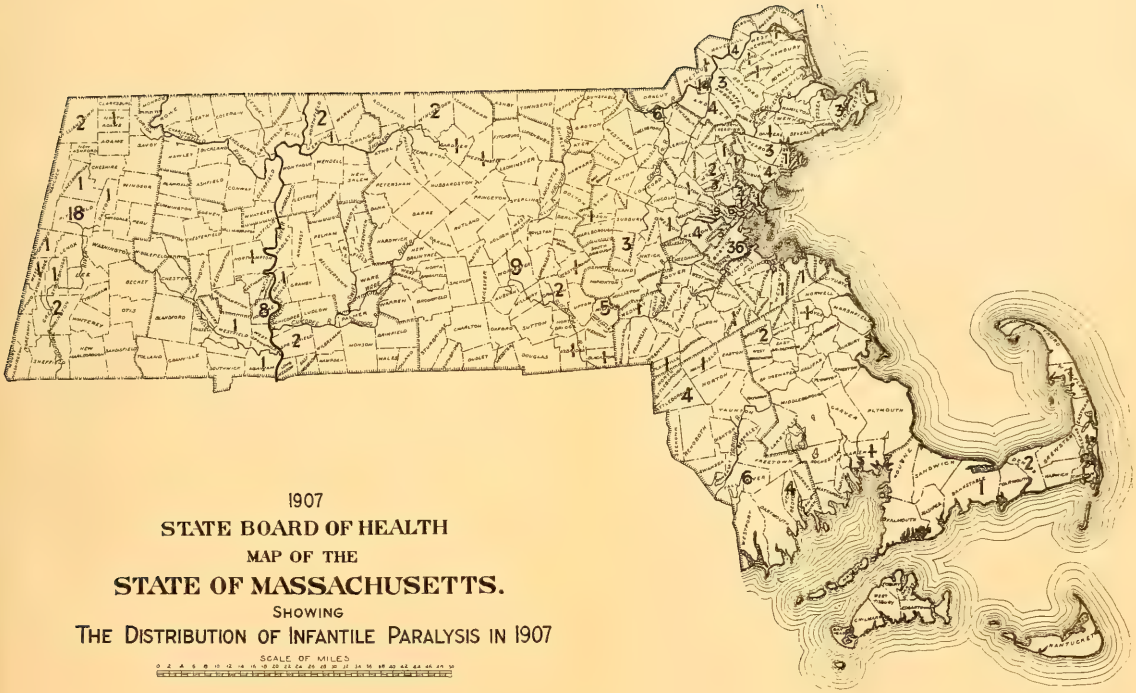

1907
STATE BOARD OF HEALTH
MAP OF THE
STATE OF MASSACHUSETTS.
SHOWING
THE DISTRIBUTION OF INFANTILE PARALYSIS IN 1907
SCALE OF MILES

FIG. 1.

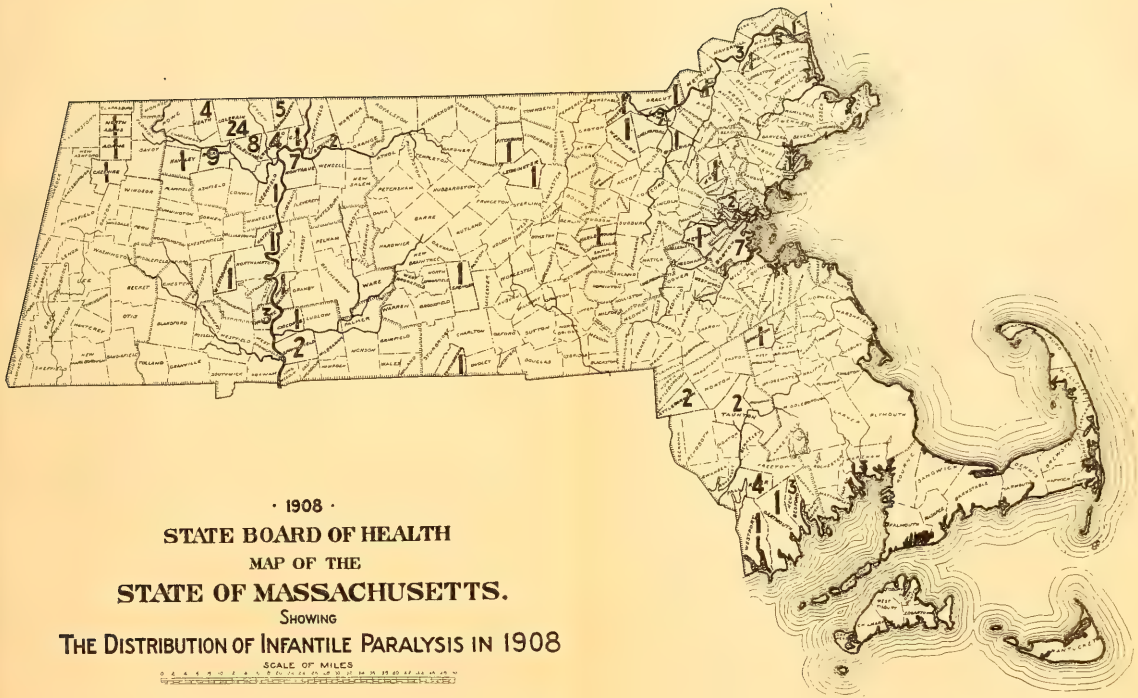

· 1908 ·
STATE BOARD OF HEALTH
MAP OF THE
STATE OF MASSACHUSETTS.
SHOWING
THE DISTRIBUTION OF INFANTILE PARALYSIS IN 1908
SCALE OF MILES

FIG. 2.

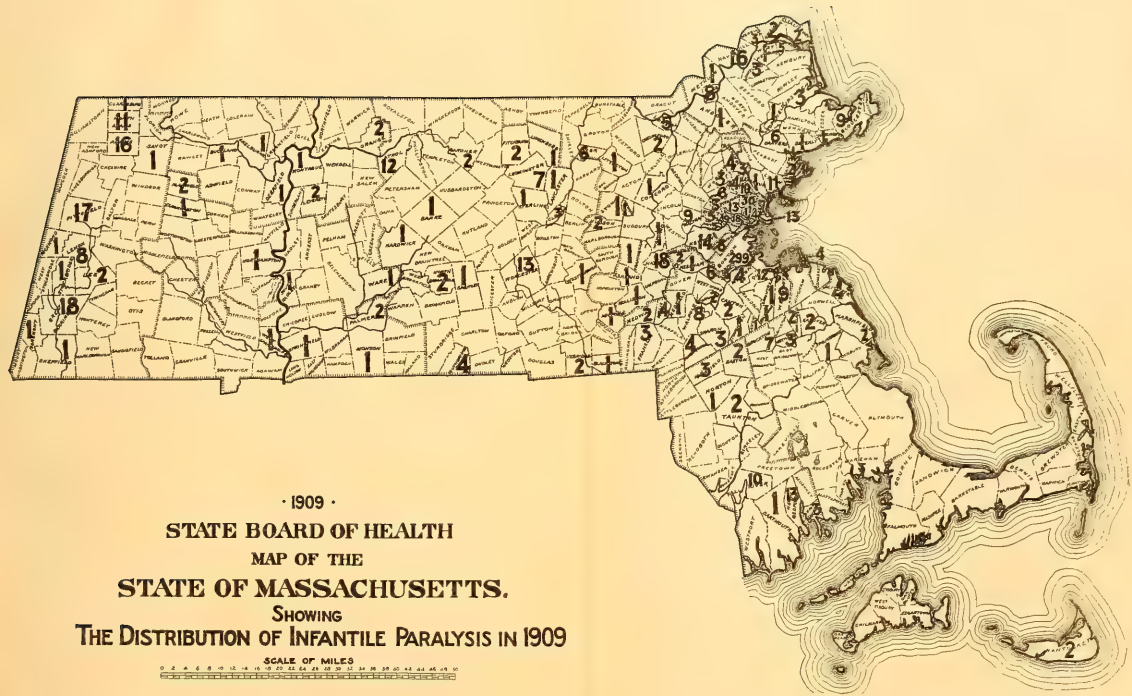

· 1909 ·
STATE BOARD OF HEALTH
MAP OF THE
STATE OF MASSACHUSETTS.
SHOWING
THE DISTRIBUTION OF INFANTILE PARALYSIS IN 1909
SCALE OF MILES

FIG. 3.

List of 25 Cities and Towns where the Disease was most prevalent.

Town.	Population.	Cases.	Incidence per Thousand.
Plainfield,	382	2	5.26
Millis,	1,089	4	3.66
Leverett,	703	2	2.83
Great Barrington,	6,388	18	2.81
Lenox,	3,058	8	2.61
Ayer,	2,386	6	2.51
Walpole,	4,000	8	2.00
Hull,	2,060	4	1.94
Natick.	9,705	18	1.85
Easton,	1,089	2	1.83
Savoy,	549	1	1.81
Winthrop,	7,814	13	1.70
Richmond,	601	1	1.66
Athol,	7,305	12	1.64
Merrimac,	1,884	3	1.59
Scituate,	2,597	4	1.54
Sharon,	2,085	3	1.44
Egremont,	721	1	1.38
Cummington,	740	1	1.35
Groveland,	2,401	3	1.25
Salisbury,	1,622	2	1.23
Foxborough,	3,364	4	1.18
Adams,	13,685	16	1.17
Belmont,	4,360	5	1.15
Marshfield,	1,763	2	1.12

List of 25 Cities and Towns where the Disease was least prevalent.

Town.	Population.	Cases.	Incidence per Thousand.
Gardner,	13,066	2	.15
New Bedford,	85,516	13	.15
Maynard,	7,147	1	.14
Spencer,	7,121	1	.14
Lynn,	84,623	11	.13
Marblehead,	7,209	1	.13
Saugus,	7,189	1	.13
Montague,	7,707	1	.13
Braintree,	7,595	1	.13
Brockton,	55,039	7	.12
Lawrence,	7,050	8	.11
Ware,	8,858	1	.11
West Springfield,	8,897	1	.11
Methuen,	9,608	1	.10
Fall River,	106,486	10	.09
Chelsea,	40,080	4	.09
Framingham,	11,749	1	.08
Milford,	12,722	1	.08
Taunton,	30,967	2	.064
Beverly,	13,386	1	.061
Fitchburg,	34,263	2	.058
Salem,	39,019	2	.051
Lowell,	94,889	5	.05
Northampton,	21,075	1	.04
Springfield,	84,237	1	.012

General Conditions.

Aside from the immediate environment of the patients, there are certain general considerations of possible interest.

Rainfall by Years.

The last six years have been very dry. In 1907 there was practically a normal rainfall, and 234 cases in the State. In 1908, a very dry year with 7 inches deficiency of rainfall, there were few cases — 136. In 1909, with more rain (3 inches deficiency), there were 923 cases. In Massachusetts the prevalence of the disease by the year has not, therefore, been coincident with deficiency of rainfall.

Deficiency Rainfall, 1904–1909, inclusive.

Year.	Cases in State.	Actual.	Normal.	Deficiency.
1904,	–	43.81	45.16	—1.35
1905,	–	37.60	–	—7.56
1906,	–	43.21	–	—1.95
1907,	234	44 49	–	—0.67
1908,	136	37.61	–	—7.55
1909,	923	42.10	–	—3.06
				—22.14

Rainfall by Months in 1909.

The chart of the rainfall in 1909 in the State, arranged by months, does not correspond with the prevalence of the disease in the State, arranged also by months, the driest month preceding the month of greatest frequency of the disease in the same way that the driest year preceded the year when the disease was most prevalent.

Temperature by Months in 1909.

The curve of the average monthly temperature in Massachusetts in 1909 does not correspond with the curve of the frequency of the disease, the highest average temperature falling away before the highest incidence of the disease occurs.

Number of Families affected and Possible Abortive Cases.

To make the following analyses clearer, the following table is important as showing that the 150 cases carefully studied occurred in 142 families, and also showing the probable existence of a fairly large number of abortive cases associated with them.

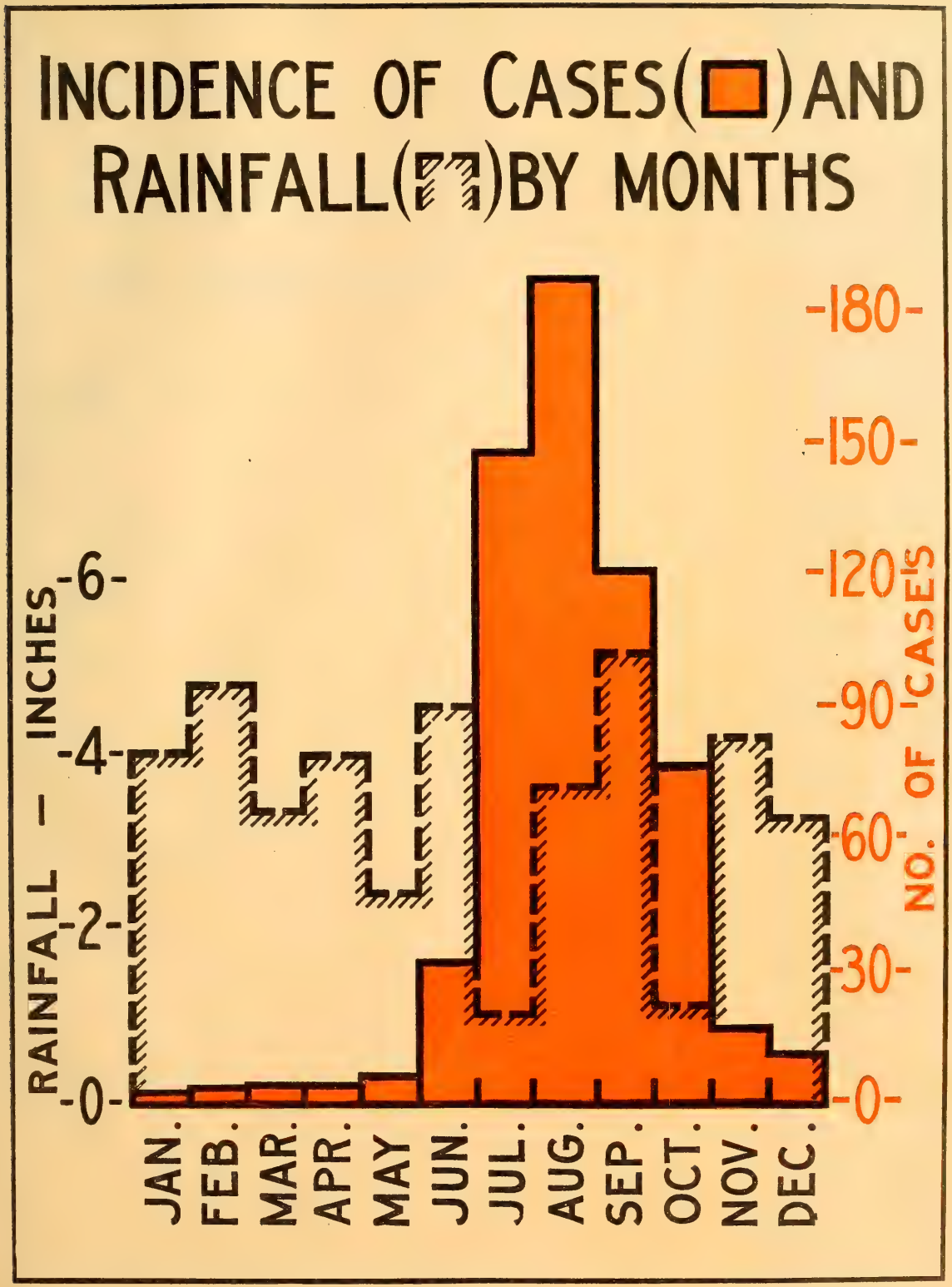

INCIDENCE OF CASES( ) AND
RAINFALL( )BY MONTHS
RAINFALL - INCHES
-0-
-2-
-4-
-6-
NO. OF CASES
-0-
-30-
-60-
-90-
-120-
-150-
-180-
JAN.
FEB.
MAR.
APR.
MAY
JUN.
JUL.
AUG.
SEP.
OCT.
NOV.
DEC.

FIG. 4.

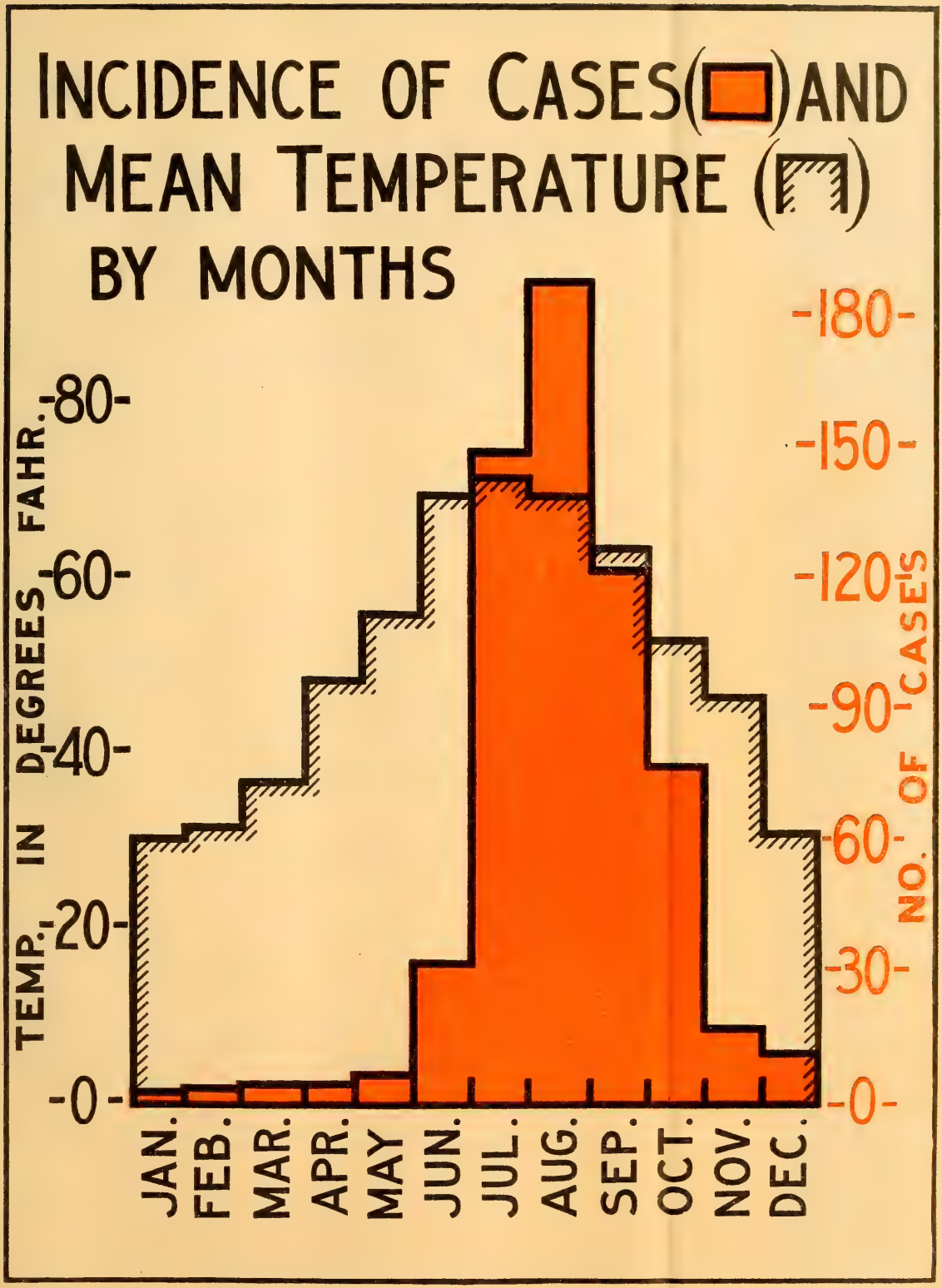

INCIDENCE OF CASES( )AND
MEAN TEMPERATURE ( )
BY MONTHS
TEMP. IN DEGREES FAHR.
80
60
40
20
0
NO. OF CASES
180
150
120
90
60
30
0
JAN.
FEB.
MAR.
APR.
MAY
JUN.
JUL.
AUG.
SEP.
OCT.
NOV.
DEC.

FIG. 5.

The 150 cases of paralysis carefully studied occurred in 142 families. The total number of children under fifteen in these 142 families was 479. The total number of children sick from any cause in these families contemporaneously with the occurrence of paralysis was 187, and 12 adults. Of the 187 sick children, 149 were paralyzed; of the 12 adults, 1 was paralyzed. This leaves 49 cases of contemporaneous illness, not followed by paralysis, which are to be reckoned as possible abortive cases of the disease.

Analysis of Cases thoroughly studied.

[150 cases of paralysis in 142 families.]

Total number of children,		479
Number of children sick,	187	
Number of adults sick,	12	
		199
Number of children paralyzed,	149	
Number of adults paralyzed,	1	
		150
Possible abortive cases,		49

Surroundings of Patients.

The following tables relate to the environment of the patients in the 150 cases carefully studied, and are largely self-explanatory.

The nearness of the house to the railroad was investigated on account of the data of certain Swedish observers, showing its frequency in these localities. Even in a district where railroads were frequent, the bulk of the cases were well removed from the tracks.

Nearness of House to Railroad.

	Cases.
On,	7
Within 20 yards,	4
Within 40 yards,	4
Within 100 yards,	17
Within 200 yards,	22
Within 300 yards,	13
Within 500 yards,	37
Over 500 yards,	46
	150

Nearness to Water (Stream, Pond or Beach).

	Houses.
Within 50 yards,	6
Within 100 yards,	27
Within 200 yards,	21
Within 300 yards,	8
Within 400 yards,	10
Within 500 yards,	7
Within 600 yards,	5
Within 700 yards,	1
Within 800 yards,	9
Over 800 yards,	56
Cases,	150

Analyzing the age of infected houses, it is evident from the following table that most of the 150 cases occurred in old houses. Yet the majority of houses in a city are old. But in Dorchester, where many cases were investigated, building is active and many of the houses are new. It seemed as if the average age of infected houses was probably higher than that of the houses of those districts taken as a whole.

Age of House.

	Houses.
1 year old,	2
1½ years old,	1
3 years old,	5
4 years old,	3
5 years old,	4
10 years old,	28
15 years old,	24
20 years old,	17
30 years old,	22
30+ years old,	44
	150

Sanitary Conditions.

	Cases.
Excellent,	36
Good,	50
Fair,	37
Bad,	19
Not stated,	8
	150

Location of House.

	Cases.
High,	43
Medium,	65
Low,	42
	150

	Cases.
Dry,	105
Damp,	45
	150

Character of House.

	Cases.
Detached house,	64
Tenement house,	86
	150

Floor of House inhabited by Family.

The whole house,	55
The first floor (3 of which also occupied basement),	43
The second floor,	36
The third floor,	20

Character of Sewage Disposal.

	Cases.
Sewer, metropolitan,	109
Sewer, city,	19
Cesspool,	13
Vault,	8
Privy,	1
	150

Character of Water Supply.

	Cases.
Metropolitan,	109
Town,	17
City,	22
Well,	2
	150

The amount of dust as described by the families may be taken at its face value, the majority of cases reporting from a moderate amount upward.

Relation to Dust.

	Cases.
No dust,	–
Very little dust,	29
Moderate amount of dust,	83
Much dust,	37
Excessive amount of dust,	1
	150

Prevalence of Vermin, Insects and Rodents.

Inasmuch as the disease in many respects suggests that it is insect-borne, the following table was compiled from the account of the family aided by the observation of the investigators. It may be added that the investigators were fully aware of the importance of obtaining accurate answers to this question.

Among 142 families, 134 had vermin, etc., as follows: —

	Houses.
Flies were present in	113
Mosquitoes were present in	75
Mice (house) were present in	63
Rats were present in	54
Ants, red and black, were present in	35
Roaches were present in	35
Bedbugs were present in	31
Spiders were present in	28
Mice (field) were present in	20
Squirrels were present in	6
Biting flies were present in	3
Grubs and caterpillars were present in	3
Fleas were present in	2
Brown-tail moths were present in	1
Moles were present in	1

Paralysis in Domestic Animals.

The occurrence of paralysis among domestic animals and fowls has been found to coincide with outbreaks of the disease in the human beings in some instances reported. Inquiries were, therefore, addressed to every veterinary surgeon and every animal inspector in Massachusetts as to the occurrence of such paralysis in animals in 1909. The reported cases were then carefully laid off on a map of the State and the relative distribution of the animal cases compared with that of the human cases. No correspondence was found to exist, so that, so far as these data can be depended on, no obvious connection on the whole existed between the two classes of cases in Massachusetts in 1909.

The health of the domestic animals in the 142 families is shown in the table. In 34 out of 87 families having domestic animals, sickness, paralysis or death occurred in these animals about the time of the paralysis in human beings.

The relation of this disease to paralysis in domestic animals is, however, a matter requiring much more extensive investigation and is at present wholly unknown.

Data as to Domestic Animals.

	Families.
No animal of any kind in	55
Animals in	87
	142

(*a*) 22 homes had 28 dogs without sickness.
53 homes had 73 cats without sickness.
11 homes had 760 hens without sickness.
9 homes had 17 birds without sickness.
7 homes had 11 horses without sickness.
1 home had 20 cows without sickness.
1 home had 3 pigs without sickness.
1 home had 1 lamb without sickness.

(*b*) 3 homes had 3 dogs with sickness.
10 homes had 10 cats with sickness.
4 homes had 6 hens with sickness.
1 home had 1 bird with sickness.

(*c*) 2 homes had 2 cats with paralysis.
3 homes had 4 hens with paralysis.
1 home had 1 dog with paralysis.

(*d*) 4 homes had deaths in 5 cats.
4 homes had deaths in 4 hens.
1 home had deaths in 2 rats.
1 home had death in 1 dog.
18 homes had illness in 20 animals.
6 homes had paralysis in 7 animals.
10 homes had deaths in 12 animals.

Total, 34 homes had illness, paralysis or deaths in 39 animals.[1]

[1] The following letter, which reached the Board through the State Board of Health of Minnesota, is of possible interest in this connection: —

"In my veterinary practice during the past five or six years I have found a disease appearing among one and two year old colts that shows a line of symptoms corresponding very closely to anterior poliomyelitis of children. I have had from 5 to 10 cases a year during this time, the cases always occurring during the summer months, and the majority of them during the month of August. The affected colts are usually found in the pasture, unable to stand. The owner sometimes will notice an unsteady gait for twenty-four hours before entire loss of motion occurs. At first these colts have a rise of temperature ranging from 103° to 104° F.; pulse and respiration accel-

Relation to Rabies.

The relation of the disease to rabies was investigated, and in 3 of the towns carefully studied epidemics had occurred in the past, but no outbreak of rabies in 1909 had any relation to these 150 cases of paralysis, and no one of the 150 paralyzed children had in the past received the Pasteur treatment.

Communicability.

With regard to evidences of communicability in our series of cases, it seems proper that in so important a matter our conclusions should only be presented after a very careful study of all the facts.

We have had instances of direct contagion from child to child, with an incubation period of one to fourteen days. We have had a number of instances of what appeared to be indirect contagion by a healthy carrier, and finally we have had 11 instances in the 150 cases where the disease followed intimate contact with persons with old infantile paralysis, often of many years' standing. The latter cases seemed to be unworthy of mention in a serious report, but after consultation with our advisory board it seemed worth while to allude to the matter for what it is worth; *e.g.,* a child of two and one-half was not, so far as known, in direct or indirect contact with any acute case, but was, previous to his attack, daily fondled and cared for by a girl of fourteen, paralyzed twelve years previously. On Aug. 14, 1909, he developed the disease. The Board would not wish to be understood as advocating the view that chronic cases were sources of infection, but the frequency of such histories make it proper to mention the matter as one worthy of following up, although the general history of other diseases caused by a filterable virus would make it seem unlikely.

Instances of what would appear to have been contagion occurred in 35 out of 150 cases. They may be analyzed as follows: —

---

erated; animal sweats profusely; appetite remains fairly good, but there is some trouble noticed in swallowing, especially water; slight derangement of the bowels, tending toward constipation; more or less tympanitis present; retention of urine, — for a few hours at least; head drawn back so the end of the nose tends to assume a position somewhat on a line with the neck. The death loss is less than 10 per cent. but in those that do not recover the market value is depreciated to a very great extent because of the faulty gait the animal assumes after an attack of this disease, due to atrophy and contraction of certain muscles, or certain groups of muscles. It seems that the flexor muscles of the limbs especially are more often affected than the extensor, and in almost all the cases some of these deformities are likely to remain permanent. The flexors of the limbs are liable to contract and cause volar flexion of the fetlock. The elevators of the head are also likely to become affected, so as to cause the head to have a poky appearance; that is, it is carried out from the body.

"After one of these attacks the colt will remain down from one to three weeks, and will then continue to improve for a period of one year, but seldom, if ever, makes a complete recovery.

Dr. C. S. Shore.

Lake City, Minnesota."

Instances of Contagiousness.

	Cases.
Certain direct contact with acute case,	14
Certain direct contact with abortive case,	1
Certain direct contact with chronic case,	14
Certain direct contact with both acute and chronic cases,	2
Certain indirect contact with acute case by third person,	4
	35

The contact was so intimate between the cases, and so constant, that there is no certain means of determining the day of the illness on which the sick child gave the disease to the other, or, in other words, the period of incubation in the recipient.

Families with more than One Case.

	Cases.
134 families with	1
7 families with	2
1 family with	3
142	

Cases among the Acquaintances of Patient.

(*a*) In 22 instances there occurred 1 other acute case, either shortly before or after.

(*b*) In 2 instances there were 2 acute cases each among acquaintances.

(*c*) In 2 instances, 4 acute cases each.

(*d*) And in 1 instance there were 6 acute cases.

(*e*) In 13 instances there was 1 chronic case each among the acquaintances of patient.

It is not demonstrated that contact necessarily took place between these individuals.

As bearing on the question of contagion, the places to which visits were made within a month before the attack was investigated.

Places visited by Patient before Attack.

(*a*) No history of visits known, 42; (*b*) Revere Beach, 38; (*c*) City Point, 18; (*d*) Savin Hill Beach (Dorchester), 15; (*e*) Boston, 12; (*f*) Nantasket, 11; (*g*) Winthrop Beach, 8; (*h*) Dorchester Beach, 6; (*i*) Gloucester, 5; (*j*) Dewey Beach (Charlestown), 5; (all these places were known to be infected areas); (*k*) 3 other towns were visited by 4 cases each; of these 3 towns, 2 were known to be infected areas; (*l*) 8

other towns were visited by 3 cases each; of these 8 towns, 7 were known to be infected areas; (*m*) 10 other towns were visited by 2 cases each; of these 10 towns, 7 were known to be infected areas; (*n*) 40 other towns were visited by 1 case each; of these 40 towns, 25 were known to be infected areas.

Institutions for Children.

It was suggested by the advisory committee that it might be worth while to look into the prevalence of the disease in asylums, etc., where healthy children lived and were removed from the ordinary conditions of street life, many of which institutions were in the midst of infected districts. Forty-five such institutions were investigated, where 3,600 young children lived. Only 1 child of the 3,600 developed the disease, and this was under such remarkable conditions that the case may be mentioned.

E. R. (age two years and four months) entered the St. Mary's Infant Asylum in Dorchester on Aug. 28, 1908. In February, 1909, the child had measles and was taken to the South Department of the Boston City Hospital. No other sickness since becoming an inmate of the asylum.

On Sept. 30, 1909, the child had a typical attack of infantile paralysis; the diagnosis was made by the attending physician and confirmed at the Children's Hospital. Partial paralysis of one leg still persists.

This child is one of a class of walking children in the institution, numbering in all 40. At the time of his illness, 2 or possibly 3 other children suffered from slight vomiting and diarrhœa. Nothing else remarkable.

This child lived as regular institution children do, playing with his 40 companions on one floor and one porch.

The child never left the institution after he entered save to go to the City Hospital at the time of the attack of measles, several months before. No one had visited the child or sent food, toys, etc., for several months before onset.

During the month of September only 6 new children were admitted to that part of the asylum. None of these had illness of any sort.

The child, at the time of onset, showed no marks or bites or wounds. His diet was that usually given in an asylum for children, viz., mashed potatoes, meat juices, soups, bread and milk, oatmeal, and, very rarely, fruit. The children sleep 16 in a room, and all eat in the same dining hall.

The child was not isolated during his illness and no other cases occurred.

Conditions, General and Special, preceding the Attack.

The general and individual conditions preceding the attack are shown in certain matters in the following tables: —

Swimming or Wading.

The frequency with which swimming or wading was mentioned as an antecedent in previous years attracted our attention and was embodied in a question on our blank. Nearly half of the cases had been swimming or wading in water contaminated by sewage shortly before the onset of the disease.

Out of 150 cases, 62 were swimming or wading just before onset.

Water was contaminated by sewage in	54 instances.
Water was contaminated more or less in	8 instances.
	62
No history of swimming or wading in	88 instances.
	150

Exposure to Heat, Cold or Dampness preceding the Attack.

	Cases.
To heat, ...	39
To cold, ...	25
To dampness, ...	36
Not exposed, ...	50
	150

Accident, Fall or Overexertion preceding Attack.

107 cases had no such history.
34 cases had history of fall.
9 cases had history of overexertion.

150

Diseases prevalent in Town at Time of Occurrence of Infantile Paralysis.

	Families.
Not known,	103
La grippe,	5
Measles,	7
Whooping cough,	4
Digestive troubles,	8
Rheumatism,	3
Mumps,	2
Scarlet fever,	2
Malaria,	2
Tonsilitis,	2
Coryza,	1
Chickenpox,	1
Typhoid,	1
Diphtheria,	1
	142

Diet.

General (45 had limited or modified diets),	105
(*a*) Raw cow's milk,	120
(*b*) Condensed milk,	14
(*c*) Breast milk and other food,	14
(*d*) Breast milk alone,	–
Fish,	80
Fruit,	100
Berries,	89
Meat,	90
Canned goods: (*a*) fruits; (*b*) vegetables; (*c*) or fish,	82
Cereals,	15
Bread and butter,	23
Vegetables,	90
Stews and soups,	11
Eggs,	14
Tea, 2; cocoa, 3; coffee, 1,	6
Malted milk,	2
Ice cream,	8
Predigested and beef juices,	4
Candy,	2
Bananas,	6

Articles of diet are said to have been taken by the affected children, as shown in the accompanying table. As many of the cases partook

of several kinds of food, the total is much in excess of the total number of cases.

It is important to note that no child living on breast milk alone in the 150 cases carefully studied was affected by the disease.

Data as to School Attendance.

	Cases.
School was not attended by	115
School was attended by	35 [1]
	150

Of the 35 cases attending school: —

	Cases.
Edward Everett, Dorchester, was attended by	3
Winthrop Primary (including center) was attended by	4
Concord Street, Boston, was attended by	2
Savin Hill School was attended by	2
Each at a different school,	22
School unknown,	2
	35

Possibly favoring Conditions preceding or attending Infection.

Insect bites or stings, 35; wounds, 13; sore throat, 42; diarrhœa, 35; otitis media, 2; coryza, 4; measles, 1; pin worm, 1; bronchitis, 1.

Ninety-three had one or more of the above possible sources of infection; 57 had no such history. Total, 150 cases.

Incidence of the Disease.

Sex. — Three hundred and sixty-three males and 263 females were affected.

Age. — By the figures it is seen that the incidence is greatest between the ages of two and three. After ten years of age the chart deals only with ten-year periods and the average number of cases per year only is represented.

In the chart of age periods it is shown that only 7 per cent. of the cases occur in the first year of life, but 71 per cent. of cases occur in the first five years and 87 per cent. of cases in the first ten years.

[1] School attendance, was not, however, necessarily continuous up to the time of the attack.

By Ages.

Age.	Cases.	Age.	Cases.
3 weeks,	1	10 years,	15
2 months,	2	11 years,	5
3 months,	1	12 years,	9
4 months,	1	13 years,	4
5 months,	2	14 years,	11
6 months,	2	15 years,	2
7 months,	2	16 years,	3
8 months,	5	17 years,	2
9 months,	3	18 years,	1
10 months,	3	19 years,	7
11 months,	6	20 years,	2
12 months,	16	21 years,	4
13 months,	5	22 years,	5
14 months,	11	23 years,	3
15 months,	3	25 years,	3
16 months,	12	27 years,	1
17 months,	5	28 years,	1
18 months,	22	29 years,	2
19 months,	6	30 years,	2
20 months,	12	33 years,	2
21 months,	12	34 years,	1
22 months,	5	35 years,	2
2 years,	121	40 years,	2
3 years,	90	41 years,	1
4 years,	60	62 years,	1
5 years,	32	72 years,	1
6 years,	31	Not stated,	13
7 years,	30		
8 years,	9		628
9 years,	13		

By Age Periods.

	Boston.	Per Cent.	New York.[1]
From birth to 12 months, inclusive,	44	7.15	62
1 year old,	93	–	221
2 years old,	121	–	180
3 years old,	90	–	106
4 years old,	60	–	63
5 years old,	32	71.54	28
	440	–	–
6 to 10 years, inclusive,	98	87.48	47
	538	–	–
11 to 20 years, inclusive,	46	94.96	19
	584	–	–
21 to 30 years, inclusive,	21	–	2
31 to 72 years, inclusive,	10	–	1
Not stated,	13	–	23
	628	–	752

[1] For purposes of comparison the New York figures are included.

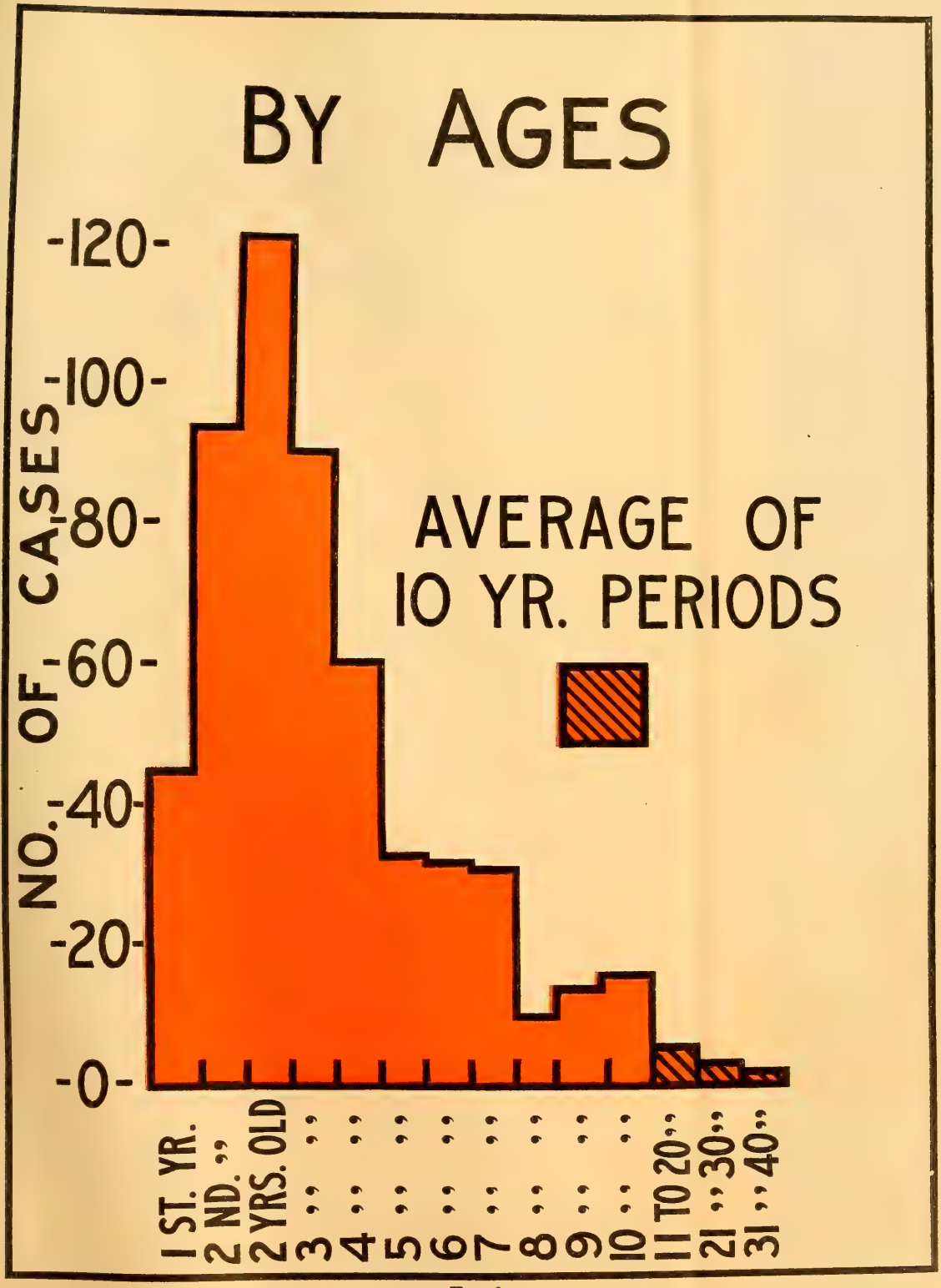

BY AGES
-120-
-100-
-80-
-60-
-40-
-20-
-0-
NO. OF CASES
AVERAGE OF
10 YR. PERIODS
1 ST. YR.
2 ND. ,,
2 YRS. OLD
3 ,, ,,
4 ,, ,,
5 ,, ,,
6 ,, ,,
7 ,, ,,
8 ,, ,,
9 ,, ,,
10 ,, ,,
11 TO 20 ,,
21 ,, 30 ,,
31 ,, 40 ,,

FIG. 6.

Mortality.

The average total death-rate in 628 cases was 8 per cent. The mortality was greatest over ten years of age, reaching 20 per cent. in that period. Under one year the mortality was also high — 16 per cent.; between the ages of one and ten being lowest — 4 per cent.

Mortality by Age.

Age.	Cases.	Deaths.	Mortality (Per Cent.).
Under 1 year,	44	7	16
1 to 10 years,	494	20	4
Over 10 years,	77	16	20
Not stated,	13	8	–
Total,	628	51	–
Average mortality,	–	–	8

Early Symptoms.

Cases, 150. Cases not stated, 3.

Symptoms reported in 147 cases: fever, 132; pain, 110; tenderness, 108; vomiting, 67; constipation, 72; retraction of head, 60; diarrhœa, 38; headache, 33; delirium, 15; anorexia, 15; irritability, 24; stupor and restlessness, 14; malaria, 9; nausea, 18; convulsions, 4; twitchings, 3; cough, 8; dyspnea, 4; sore throat, 8; numbness, 3; chills, 2; weakness, 1; coma, 2; abdominal distention, 7; pain in abdomen, 1; jaundice, 1; vertigo, 2; double vision, 2; difficulty or inability to swallow, 4; difficulty in articulation, 2; gastro-intestinal upset, 2; diaphragmatic breathing, 1; coryza, 1.

Six cases had skin eruptions; 1, measles and mumps; 1, whooping cough; 1, malaria.

Details of Digestive Disturbances connected with Attack.

	Cases.
(*a*) Not stated,	9
(*b*) Having no digestive disturbance,	15
(*c*) With digestive disturbance, tabulated as follows: —	
(1) Preceding attack: —	
Indigestion or stomach "upset,"	4
Nausea and vomiting,	37
Constipation,	31
Colic,	2
Diarrhœa,	12
Mucus in stools,	2

	Cases.
(2) Accompanying attack: —	
Indigestion (indefinite),	3
Nausea and vomiting,	51
Constipation,	55
Colic,	8
Diarrhœa,	24
Mucus in stools,	1
(3) Following attack: —	
Nausea and vomiting,	4
Constipation,	37
Colic,	2
Diarrhœa,	10
Mucus in stools,	2

Disturbances of Intestines during Attack.

	Cases.
No disturbance in	53
Constipation,	63
Diarrhœa,	22
Involuntary defecation,	4
Constipation, later diarrhœa,	4
Diarrhœa, later constipation,	4
	150

Disturbances of Bladder during Attack.

	Cases.
No disturbance,	114
Retention,	23
Frequent micturition,	3
Incontinence,	9
Retention, later incontinence,	1
	150

Pain and Tenderness.

The frequency of pain and tenderness, sometimes local, sometimes pretty general, is not sufficiently regarded as an early and persistent symptom. The accompanying table is presented to emphasize the point that it occurred in 420 and was absent only in 82 out of 502 cases in which its presence or absence was noted: —

	Cases.
Pain or tenderness was present in	420
Pain or tenderness was absent in	82
Pain or tenderness not stated in	126
	628

The pain or tenderness lasted: —

	Cases.
No pain,	82
One day or less,	7
Two days,	16
Three days,	22
Four days,	11
Five days,	10
Six days,	3
A few days,	13
One week,	47
One to two weeks,	75
Two to three weeks,	36
Three to four weeks,	26
One to two months,	28
Two to three months,	5
Several months,	3
Until death,	11
Present when report was made,	107
Not stated,	126
	628

Appearance of Paralysis in Days after Onset of Fever.

	Cases.
Same day,	30
One day,	36
Two days,	27
Three days,	23
Four days,	14
Five days,	7
Six days,	5
Seven days,	1
Eight days,	1
Eleven days,	1
Twelve days,	1
Fourteen days,	2
Sixteen days,	1
Not known, fatal,	1
	150

Distribution of Paralysis.

The distribution of the paralysis is shown in the table. It is interesting to note that when one arm and leg are paralyzed a hemiplegic distribution is more common than a crossed paralysis, and the frequency of facial paralysis is worthy of note.

One leg only,	192
Both legs only,	151
One arm only,	32
Both arms only,	11
One arm and leg, same side,	57
One arm and leg, opposite sides,	17
Both legs and one arm,	38
Both arms and one leg,	6
Both arms and both legs,	82
Not stated,	12
Back,	83
Abdomen,	37
Face,	8
Right face,	16
Left face,	10

Prognosis.

Recovery Rate in 628 Cases.

In answer to the question, "Has paralysis entirely disappeared?" the replies were as follows: —

Yes (10.8 per cent.),	62
No,	404
Partially,	61
Death,	51
Not stated,	50
	628

This table is intended to emphasize the fact that what appears to be recovery in the eyes of the family physician occurs more frequently than is generally supposed, 10 per cent. of such cases being reported. This led to a closer investigation of the recoveries in the 150 cases carefully investigated, and it was reported by the investigators that 25 of these (16.7 per cent.) had wholly recovered. This report was not accepted and the investigators were sent again to these children, and each child was stripped naked and the separate movements of ankle, knee, hip, spine, abdomen and arms were separately tested. From this careful examination it is sure that 25 children out of 150 have recovered since the disease in 1909. The following tables deal only with these 25 cases.

Age of 25 Recovered Cases.

So far as one may generalize from these few cases, it would seem that the average age of the children was higher than in the cases in general.

Age.	Cases.	Age.	Cases.
1 year,	3	9 years,	1
2 years,	1	10 years,	1
3 years,	5	14 years,	1
4 years,	5	21 years,	1
5 years,	2		25
6 years,	4		
7 years,	1		

Onset.

The character of the onset was mild in 6, moderate in 17 and severe in 2.

Evidence of Paralysis.

The presence of paralysis in the beginning is vouched for by the attending physician in 23 cases and by the family in 2, and the distribution of paralysis was on the whole fairly extensive, as shown by the table.

Extent of Paralysis in 25 Recovered Cases.

One thigh and leg,	4
Both thighs and legs,	8
Both thighs,	1
One leg,	2
One arm,	1
One leg, arm and back,	1
One leg and back,	1
One thigh, leg, arm and forearm,	1
One arm, forearm and cervical region,	1
Cervical region,	4
Indefinite staggering gait,	1
	25

The extent of the paralysis, therefore, did not differ essentially from that of the whole group presented above.

Duration of Paralysis in 25 Recovered Cases.

Time.	Cases.	Time.	Cases.
3 days,	2	8 weeks,	8
1 week,	3	12 weeks,	4
2 weeks,	3		
3 weeks,	2		25
4 weeks,	3		

Tenderness in Recovered Children.

It was thought that such cases being slighter might show less tenderness in the acute stage, but the tenderness was about as frequent as in the severer cases.

Pain or tenderness in the acute attack existed in 19 out of 25 recovered cases.

Duration of Tenderness.	Cases.	Duration of Tenderness.	Cases.
2 days,	1	3 weeks,	1
3 days,	1	4 weeks,	3
7 days,	6	6 weeks,	1
10 days,	1	8 weeks,	2
2 weeks,	2	12 weeks,	1

The statement may, therefore, be made that in the whole group of 628 cases, 10.8 per cent. were reported as wholly recovered; that in the smaller group of 150 cases, 16.7 per cent. are known to have recovered; and that a study of character of onset, distribution and tenderness in these cases gives no means of distinguishing them from other cases at the time of the attack.

Prevention.

In the matter of prevention of the disease in Massachusetts, in November, 1909, it was made one of the notifiable diseases, like scarlet fever, etc. In a recent circular addressed to physicians it has been advised by the Board that such cases should be quarantined, and that urine, stools and sputum should be disinfected, and we have called attention to the existence of abortive cases as probable sources of contagion.[1]

[1] In a recent communication, Flexner and Lewis report that a 1 per cent. solution of peroxide of hydrogen in perhydrol has been found to distroy the virus. In view of their belief that the entrance of the virus is probably by the respiratory tract, the use of a nasal douche of this character would seem advisable.

CONCLUSIONS.

These data are presented as a report of progress in an investigation which will be continued, and no conclusions are drawn from them.

That the effort of the State Board meets with general approval is shown by the fact that the following resolution was adopted in Washington, on May 5, 1910, by the American Orthopedic Association and the American Pediatric Society: —

> It having been shown by recent epidemics, and investigations connected with the same, that epidemic infantile spinal paralysis is an infectious, communicable disease which has a mortality of from 5 per cent. to 20 per cent., and that 75 per cent. or more of the patients surviving are permanently crippled, State Boards of Health and other health authorities are urged to adopt the same or similar measures as already adopted and enforced in Massachusetts for ascertaining the modes of origin and manner of distribution of the disease, with a view to controlling and limiting the spread of so serious an affection.

What the course of the disease may be in 1910 in Massachusetts cannot be predicted. It would be expected from the history of the disease that a year of comparative immunity in the State as a whole would follow the great prevalence of the disease in 1909, and it is, therefore, disappointing to find 22 cases reported in the first five months of 1910, as against 15 cases for the same five months in 1909. Whether this means merely an increased attention on the part of the profession, or a really increased prevalence of the disease, time alone will show.

The object of the inquiry in 1910 will be twofold.

First, the formulation and classification of early symptoms and types of the disease, with especial reference to early diagnosis; and, second, a study of the conditions under which contagion seems to occur, with a continued search as to the mode of entry of the virus into the body.

The medical profession must remember that the Board of Health acts only as the agent of the profession in assembling the data provided by them, and depends on them for the same willing co-operation that it has met and is profoundly grateful for in the past.

The report for 1910 will be what the profession makes it, and the Board is anxious not only for the prompt and full report of typical cases, but also for notification of suspicious and atypical cases, which are possibly of the abortive type and a most important link in the chain of evidence.

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INFANTILE PARALYSIS AS OBSERVED IN HEALTH DISTRICT No. 15 DURING 1909.

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During 1909 there were 82 cases of anterior poliomyelitis in District No. 15 (Berkshire County), 2 cases on the eastern border of the district, in Plainfield, and 2 over the line in New York State, in Austerlitz, making a total of 86 cases included in this report.

Appearance of Cases.

January and February were the only months in the year when there were no cases. Sixty-eight cases, over 79 per cent., occurred during August, September and October.

Location of Cases.

With the exception of 2 cases in Plainfield, 1 in Savoy, 1 in Richmond and 2 in Austerlitz, 6 in all, the remaining 80 cases were in the central part of the county, running north and south, following for the most part very closely the course of the streams, along which lie also the principal means of communication, including highways, electric railways and steam cars.

Cases by Towns.

City or Town.	Population.	Number of Cases.
Adams,	12,548	19
Clarksburg,	1,200	1
Egremont,	721	1
Great Barrington,	6,152	19
Lee,	4,000	2
Lenox,	3,058	7
North Adams,	23,000	11
Pittsfield,	30,000	17
Richmond,	600	1
Savoy,	549	1
Sheffield,	1,728	1
Stockbridge,	2,022	2
Plainfield,	382	2
Austerlitz, N. Y.,	–	2

Appearance of Cases Chronologically.

A table giving the occurrence of cases in chronological order shows that cases appeared impartially through the central portion of the county all through the season, except that in Great Barrington there were 19 cases, all of which appeared between September 3 and October 7, inclusive.

The number of cases in the family, and the day of illness upon which the paralysis appeared, are given below.

Number of Cases in a Family.

	Families.	Cases.
One case,	72	72
Two cases,	7	14
	79	86

Appearance of Paralysis.

Day of Disease.	Number of Cases.	Day of Disease.	Number of Cases.
First,	8	Eighth,	4
Second,	16	Ninth,	2
Third,	14	Fourteenth,	2
Fourth,	17	Not stated,	11
Fifth,	5		86
Sixth,	4		
Seventh,	3		

Possibility of the Disease being spread by Physicians.

The 86 cases were seen or attended by 40 physicians, the number of cases to each physician being as follows: —

22 physicians attended 1 case each.
8 physicians attended 2 cases each.
5 physicians attended 3 cases each.
2 physicians attended 5 cases each.
1 physician attended 6 cases.
1 physician attended 7 cases.
1 physician attended 10 cases.

In no instance was any evidence discovered to suggest that the disease had been brought into a home or transferred elsewhere by the physician in attendance. Nor were there any cases in physicians' families.

There were 6 fatal cases. There were 4 abortive cases (59, 62, 69 and 79), while 2 other possible abortive cases, not included in the summary, are mentioned in connection with cases 1 and 18.

Aside from the instances where a second case in a family developed at an interval of from three to fifteen days after the initial case, and where the primary case may possibly be regarded as the source of infection; and aside from two instances to be mentioned, there is very little evidence pointing toward the active contagiousness of the disease in Berkshire County in 1909.

While in many places facts have accumulated indicating that in some localities, at some times, the disease is readily communicated from one person to another, and that it may perchance be carried by a third person, this series of cases, as well as the series in Western Massachusetts in 1908, studied by Emerson, leads to the conclusion that the contagiousness of the disease varies greatly in different groups of cases, even though the various groups in a given locality occur at the same period and are situated comparatively near each other.

For example, the cases in the North Adams group afford no known points of contact with each other. The same is largely true for the cases in the Pittsfield group.

The two instances particularly suggestive of contagion are given in detail in the summaries for Adams and Great Barrington (*q. v.*).

In the former, two children, giving a positive history of close personal contact (kissing) with a child already ill with the disease, promptly developed the disease themselves, and one died.

In Great Barrington, out of 19 cases within a period of thirty-four days 13 were associated with one school, 5 pupils themselves contracting

the disease, the remaining cases having brothers, sisters or other relatives, with whom they came in close contact, in attendance at the school. The 5 cases in pupils of the school were confined to the second, third and fourth grades, where the contact might readily be the more intimate on account of the younger age of the children in attendance.

These two instances are of especial interest because of the possibility of the infection entering the system through the nasopharyngeal spaces.

That the virulence of the infection varies greatly is further evidenced by the fact that in most instances but 1 case occurred in a family, that no cases occurred among the friends or relatives of a given case, and that, too, notwithstanding the most intimate contact, such as occupying the same room, sleeping in the same bed, assisting in caring for or entertaining the patient by brothers and sisters or neighboring children, and the entire absence of any attempt at isolation or quarantine.

If, as has been maintained by some, every case is to be traced to direct or vague indirect contact with some preceding case, it becomes exceedingly difficult to account for the immunity of the much larger number who are in close to intimate contact with the patient.

A map of the cases emphasizes what has been pointed out previously, that with a half dozen exceptions the cases are located in the valley, close to the streams, the travelled highways and the steam and electric railway lines.

Under the circumstances it seems reasonable to isolate the patient ill with acute anterior poliomyelitis until the acute stage is past, and to urge physicians and families to be suspicious of acute attacks of disturbances of digestion, accompanied by fever and pain, particularly if at the time there are other cases of the disease known in the community.

Summary, North Adams and Vicinity.

In North Adams in March occurred a sporadic case, the first of the year. The remaining cases, 11 in all, occurred in May (1 case), September 15 to 29 (4 cases), and October 4 to 20 (5 cases).

One case taken ill March 2, involving eventually the whole body, was fatal twelve days later from paralysis of respiration.

In each instance there was but 1 case in the family, unless the brother of the Clarksburg case (case 1), taken ill two days later with fever, vomiting and general achiness, be regarded as an abortive case.

It is doubtful if the sister of case 7, ill for two days at the same time with fever, is to be considered as an abortive case.

Location.

Two cases were within one-half to one-quarter mile of the North Branch of the Hoosick River, while 10 were close to or comparatively near the Hoosick River or its North or South Branches.

With the exception of case 7, September 29, cases 10 and 11, October 20, which were comparatively near each other, the cases were widely scattered.

So far as school attendance was concerned, but 4 of the children attended school (cases 1, 6, 8 and 10), and no 2 cases occurred in children attending the same school; and in but one instance (case 6, taken ill September 26, and case 9, taken ill October 14) were other children in the same family attending the same school, though even here they were in different grades.

Ten of the cases were attended by as many different physicians. One physician had 2 cases (case 1, October 4, case 8, October 11), but he did not attend the second family until called to see the child already ill.

There were no cases in physicians' families, though in four of them there are children.

With the possible exception of the abortive case in the family of case 1, above mentioned, none of the cases appear to have been associated with each other in any known manner.

In this connection, however, 5 cases (case 2A, May; case 3, August 13; case 4, September 15; case 5, September 25; case 11, October 20) are located on streets through which electric cars run. These same streets are also used somewhat by touring automobiles.

None of the cases are near railroad stations, and but 3 (cases 2A, 3 and 5) are at all near the railroad tracks.

Case 1.

C. R., six years, Clarksburg. Dr. F. D. Stafford, North Adams. Apparently an isolated case. Was not away from home except in North Adams several times during the week beginning September 6 (Old Home Week). After complaining of being tired for one week, taken ill October 4 with nervousness, fever (103°), retraction of the head and pain in the legs. On October 6, paralysis in both legs, more marked in the left. October 20, paralysis still present in the left leg.

Five other children in the family; they attend school in Clarksburg.

Abortive Case.

The brother Charles, eight years, was taken ill on October 6, after eating choke cherries, as his brother had done, with fever, vomiting, nervousness and general achiness. No paralysis.

Case 2.

T. G., one year, 329 River Street. Dr. W. F. McGrath, North Adams. An isolated case. Taken ill March 2 with fever and dullness. On following day the fever continued, vomiting and convulsions occurred, though the patient appeared better. The convulsions were repeated later, and according to the physician there was paralysis of the whole body, especially of the muscles of the chest and neck. Fatal on March 14, from paralysis of respiration.

One other child in the family; none in school.

Case 2A.

B. R., 23 West Main Street, North Adams. Dr. C. W. Wright, North Adams, first saw case; later, Dr. J. H. A. Matte. Without preliminary symptoms, except a slight cold for two or three days, patient suddenly felt that the left side of the face was stiff and queer, and on the following day there was complete paralysis of the left side of the face. This was probably in May. Though the condition is improved, the paralysis is still well marked (Feb. 19, 1910).

Case 3.

C. C., ten months, 183 State Street. Dr. J. H. A. Matte, North Adams. Had been having whooping cough during the preceding five weeks. Taken ill August 13, at which time the whole of the right arm was found paralyzed. September 21, paralysis still present from the shoulder to the elbow.

One other child in the family; none in school.

Case 4.

L. R., three years, 95 Beaver Street. Dr. N. M. Crofts, North Adams. With no symptoms preceding except a three-days cold, taken ill on September 15 with fever. On September 18, paralysis appeared of the right side of the face. Still present December 16.

Two other children in the family; none in school.

A sixteen-year-old girl, patient's cousin on mother's side, had paralysis at fourteen months of age, and is still unable to walk. She often visits this family.

Case 5.

E. M., three years, 1527 West Main Street, Blackinton. Dr. J. B. Hull, Williamstown. Early in August fell down stairs. No apparent injury. A week later had a prolapse of the rectum, which required replacing by a physician. During the last half of August was in Winchendon, Mass. At the end of August, on her return from Winchendon, had an attack of bowel disturbance, accompanied with fever, vomiting and diarrhœa. About September 25 became feverish (102°), irritable, restless, with pain in the back and legs, followed by vomiting and diarrhœa. About October 1 paralysis appeared in both legs. Still present, especially in the left leg (October 14).

One other child in the family, attending Blackinton School, grade 2.

Query: Did this case really begin at the end of August, and were the later symptoms in September a recurrence?

Case 6.

R. T., one year, 27 Harris Street. Dr. M. M. Brown, North Adams. During the early part of July had bowel trouble for three or four weeks. Taken ill with fever on September 26, and on following day the right arm was paralyzed.

Six other children in family; 1 attending Veazie School, grade 2, and 1 attending Johnson School, grade 5.

Case 7.

G. P., nineteen months, 60 Cliff Street. Dr. W. A. Brosseau, North Adams. Previously well. Fever on September 29. Very little pain. Constipated. On October 2, paralysis in right leg.

Five other children in the family, 2 of whom attend the Notre Dame School, grades 2 and 5.

At the time this child was taken ill a sister had a fever for two days. No other symptoms. It seems unlikely that this was an abortive case.

Case 8.

J. M., seven years, 57 Kemp Avenue. Dr. F. D. Stafford, North Adams. Taken ill October 11, with fever, headache, vomiting and pain back of eyes and in back of neck. Paralysis in right side of the face on October 13.

No other children in the family. The patient attends Houghton School, grade 3.

Case 9.

G. M., two years, 45 Williams Street. Dr. O. J. Brown, North Adams. For two weeks preceding, fingers and eyes seemed sore. On October 14, fever, vomited, did not seem to see well, and had been very quiet for two days before. On October 18 there was retention of the urine, and paralysis of both arms and both legs. Could not hold the head up.

Three other children in household; 1 attends the Johnson School, grade 7, and one attends the Drury School. Four cousins, living on Loftus Street, were frequent visitors during the illness, and they attend the Veazie School, kindergarten and grade 1.

Case 10.

J. M., six years, 14 Montgomery Street. Dr. J. F. C. Forster, North Adams. Sent home from school on October 19 on account of a headache. *Nosebleed* that evening for nearly two hours. On following day there was slight paralysis of the left side of the face, gradually becoming more pronounced during the succeeding two days.

Four other children in family. Patient returned to school at St. Joseph's, grade 1, on October 22 or 23.

Case 11.

R. T., two and one half years, 132 Union Street. Dr. A. A. Harper, North Adams. No fever. Illness began October 20 with vomiting, pain in both legs and in the right arm. Paralysis on same date in both legs and in right arm.

Two other children in the family; none in school.

Summary, Adams and Vicinity.

In Adams and vicinity there were 22 cases (Adams 19, Savoy 1, Plainfield 2).

Savoy and Plainfield cases are included in this group because Adams is the natural trading center and source of supplies.

The first cases in Adams were 3 which occurred at the end of the month on the 27th and the 29th of July. On August 3 occurred the case in Savoy, while in Adams there were cases on the 8th, 20th and 30th of the month. In Adams there were cases September 8, 18 (2) and 26.

Late in the month, September 22 and 29, occurred the Plainfield cases, both in the same family.

In October, on the 2d, 3d and 21st, occurred further cases in Adams. Between November 2 and 5 (about) there were 3 cases, and the last were on December 4 and 7, both in the same family.

Paralysis, more or less severe, was present in every case but 1 (case 28).

One case, taken ill on July 29, with paralysis of both legs and throat on August 1, was fatal on August 3, from paralysis of respiration (case 13).

In three instances there were 2 cases in the same family. In all the remaining instances but a single member of the household was afflicted.

An infant of nineteen months on High Street, was taken ill on August 20, with paralysis of the right leg on August 26 (case 18).

On August 31 a two-year-old baby living upstairs in the same house was taken with fever, diarrhœa and loss of appetite. It recovered within a few days without further symptoms. There had been some communication back and forth between the two families, and possibly this should be regarded as an abortive case.

All of the Adams cases were practically in the valley near the north and south center of the town, and near or comparatively near the South Branch of the Hoosick River. Those farther away were in every instance near some small brook feeding into the branch of the river just mentioned.

With reference to the town itself two or possibly three groups of cases may be distinguished.

One group is at the south part of the town, where the first cases occurred. Between July 27 and September 18 there were 8 cases, with 2 more somewhat at one side early in December, both in the same family.

At the north end of the town, near Renfrew, was another group of 4 cases, 3 in two adjoining tenements, between September 18 and November 5.

The 5 remaining cases, more or less scattered, were in the central portion of the town, on August 7, 30, October 2, 21, and November 2, respectively.

In Adams, again, school attendance, with one possible exception, seems to have had no part in the spread of the disease.

Two boys who attended the first grade of the Liberty Street School were taken ill on October 21 (case 23) and November 2 (case 24), respectively. The former child was out of school during the week of October 25, except for a half day on October 26. He was in attendance from November 1 to 4, inclusive, and has not been in school since. The second boy left on November 2, so that there was possible contact on October 26 and again on November 1.

Aside from these two none of the patients attended school. Nor were there any instances where other children in the same family with the patient attended the same school, except that on September 13 other children from four families where the disease existed earlier in the summer began attendance at the Commercial Street School. No new cases developed here, however.

The 22 cases were attended by 7 different physicians. In no instance had an interval of less than a month intervened between the time the physician last called at the house and the time he was called to attend the patient already ill with paralysis.

There were no cases in the families of physicians, though in four or five of the families there are children.

Possible evidences of contagion are shown in the following instances:—

The first case appeared in the south part of the town, in a boy three years of age, on July 27 (case 12). He played much with his cousin, a three-year-old-girl, who lived on an adjoining street, and kissed her on the day he became ill. She also visited him daily, and probably kissed him until she herself became ill, two days later, on July 29 (case 13). This case was fatal on August 3.

This child played frequently with a little girl of two and a half years, living two doors away, who was taken ill on August 8 (case 16). In this case there is a history of the child having kissed the preceding (case 13) after she was taken ill. The mother of the third case also visited the house of the second case after the patient's decease, and viewed the remains, on August 4 or 5.

These 3 cases are of special interest in view of the recent announcement of Dr. Flexner showing that the secretions of the nasal passages contain the infecting material.[1]

The remaining cases in the immediate neighborhood afforded no history which would indicate the source of the disease.

Of the group of 4 cases at the north end of the town, 3 appear to have been somewhat in contact.

A boy of five years (case 17A), living in a six-tenement block, was taken ill on or about September 18. A brother, seventeen years old, became ill on October 3 (case 17B).

An infant of twenty-one months (case 25A), living in the adjoining tenement, was taken ill November 5 or shortly after. This patient's mother visited in the adjoining tenement during the illness of the older brother, and the younger children played more or less with the younger brother (case 17A).

There is no evidence of the association of these cases with others in the town.

The possible contact of 2 cases in the scattered group in the center of the town has already been indicated in the paragraph on schools (cases 23 and 24).

There is nothing to indicate the source of the disease in cases 26 and 27, a brother of four years and a sister of twenty-one months, taken ill on December 4 and 7, respectively, except that if the incubation period in the majority of cases is from two to four days, as suggested by Wickman, it would seem reasonable to conclude that the sister received her infection from the brother.

With reference to the cases 29 and 30, daughter and father, in Plainfield, the following is of interest: —

The daughter, three years, became ill in the evening of September 22, after her return from Adams, where she had been during the day, on a trading trip with her mother. There was no known contact with other cases. This was the first time she or her mother had been away from home for two or three months.

At this same time, September 22, her father was ailing, but he did not really give up till September 29. Earlier in the month he had driven some horses to Springfield, spending four days in the round trip. So far as known he did not come in contact with other cases.

This man's father, who lived with him, died from heart disease on August 16. The minister from the adjoining town, who conducted the funeral two or three days later, had a child ill at the time with infantile paralysis. If this can be considered the source of infection, the incubation period was much prolonged.

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[1] Jour. A. M. A., Feb. 12, 1910, p. 535.

Two cases (case 13, July 29, and case 16, August 8) are on streets through which electric cars pass, while 5 are located on side streets very near electric car lines.

Automobile traffic through the town follows almost entirely the line of the electric cars.

Case 12.

Boy, D., three years, 15 Elm Street, Adams. Dr. P. S. Potter, North Adams, Dr. H. B. Holmes, Adams. Taken ill July 27, with fever, intense headache, vomiting, constipation. Tried to walk, but fell. Tenderness along the spine. July 29, paralysis in both legs.

There is one other child, of six years of age. No school at this season, though the child began in the fall at the Commercial Street School, grade 1.

This patient is a cousin of the following case, A. D. (case 13). The two children played together constantly. The case 13 child *saw this patient the night he was taken ill and kissed him.* She also saw him each day till taken ill herself, on July 29, and probably kissed him. Father works at the Jacquard Mill.

Case 13.

A. D., three years, 123 Commercial Street, Adams. Dr. H. B. Holmes, Adams. About the end of June fell 9 feet; no apparent injury. About July 22, considerably frightened by an automobile. Taken ill July 29, with high fever, vomiting and considerable prostration. August 1, some retraction of the head, some paresis of both legs and paralysis of muscles of mouth. Fatal on August 3, from paralysis of respiration; for thirty hours previous to death was unable to speak.

This patient is a cousin of the above (case 12), with whom she played on the day he became ill, and kissed him that night, after he was ill. Also saw him daily till taken ill herself. Also played with case 16. There is one other younger child. Father works in the Jacquard Mill.

Case 14.

B. D., four years, 8 Pearl Street, Adams. Dr. A. K. Boom, Adams. Taken ill about July 29, with fever, vomiting and some pain (child did not want to be touched). There followed about August 1 partial paralysis of both legs; the child could not stand up, and there was some difficulty in voiding urine.

One other child, a boy of seven, in the family. Four Yankee children in the other side of the house. They do not play together much because of the difference in nationality. No school at this time. The boy now goes to the Commercial Street School, grade 1. Father works at the Berkshire Mills.

There is no information obtainable of contact with other cases. Cases 12, 13 and 16 are all near, but the mothers of all agree that this child was not acquainted with them. They all live very near each other, however.

Case 15.

S. G., fifteen months, 3 Godek Street, Adams. Dr. A. K. Boom, Adams. History previous to the appearance of the paralysis, about August 7, unobtainable. The family are ignorant Poles, and even with an interpreter can furnish no satisfactory information. On August 7 both legs were paralyzed.

Taking into account the time of occurrence, the age of the patient, the nationality of the family and the location of the home, contact with other cases seems improbable.

Case 16.

D. G., two and one-half years, 127 Commercial Street, Adams. Dr. A. K. Boom, Adams. Taken ill August 8, with fever, slight stiffness of the spine and the head drawn back. On the third day vomiting. On the following day there was pain at McBurney's point, and appendicitis was suspected. On the third or fourth day, as developed later, retention of the urine occurred, only the excess from the distended bladder escaping. On the fifth day patient was removed to a hospital and operated on for a supposed intussusception of the bowel. Nothing was found except an excessively distended bladder. On August 18 appeared paralysis of both legs and the right arm, thus establishing the diagnosis.

One other child in family, attending Commercial Street School, since opened in September. Father is a fern dealer.

This child played much with case 13, and on the day he was taken ill, July 29, saw him and kissed him. Mrs. G. visited the D. family on August 4 or 5, just before the funeral, to carry some flowers, and was in the room to see the body.

Case 17.

F. O., four years, 1 Plunkett's Lane, Adams. Dr. J. H. Choquette, Adams. Taken ill on September 18 with fever, and that same night the leg (left) was paralyzed. On September 19 vomited several times. This was a mild case.

One other child in the family, younger. No school. Father works in the Jacquard Mill. The visit of the family to Plainfield in August was not near any known case on the mountain.

Case 17A.

R. S., five years, 74 Friend Street, Adams. Dr. A. Desrocher, Adams. During July and August had whooping cough. The sister next younger also had the same disease, and died from it on August 16. Taken ill about September 18, with headache, fever, vomiting and convulsions. Retraction of the head was present, and for three days he was delirious. About September 21 both legs were paralyzed. Improvement began after two weeks.

There are 5 other children; none in school. A brother works in the cloth room at the No. 4 Berkshire Mill. The father of case 25A (early in November) also worked here.

An older brother (see following case, 17B) was taken ill with this disease on October 3.

A child in the adjoining tenement was taken ill early in November (see case 25A).

Case 17B.

C. S., seventeen years, 74 Friend Street, Adams. Dr. A. Desrocher, Adams. Without previous illness, taken ill on October 3 with fever, headache, dizziness and pain in the back. Retraction of the head present. On October 10, paralysis of left leg and the right arm. For about one week not able to get about.

At present is at work as spare hand in the main mill of the Renfrew Manufacturing Company. The left leg is smaller and also weaker than the right at present (Feb. 15, 1910).

This boy is brother of the foregoing (case 17A), and it would seem probable that this was a case of contact infection from the brother. During the illness of this patient the mother of a child next door (case 25A) came to call, and the children of both families were together more or less.

Case 18.

W. S. G., nineteen months, 10 High Street, Adams. Dr. J. A. Quest, Adams. Taken ill on August 20, with fever. On 21st seemed better; on 23d cried all day; on 24th perspired and slept much of the time. The inclination to sleep continued nearly one week. On August 26th the right leg was paralyzed.

An only child. Father works in Jacquard Mill, where father of case 12, taken ill July 27, works. Before and during the illness, children living upstairs, two, four and nine years of age, played with this baby, and soon after, possibly about August 31, the two-year-old boy was taken ill (see following case).

Possible Abortive Case.

E. G., two years, 10 High Street, Adams. Dr. J. A. Quest, Adams, who made one visit as society physician, and made no record of it. Hence the uncertainty of the date of the illness. About August 31 taken ill with fever, diarrhœa, loss of appetite. This was on a Friday or a Saturday. When sent for the physician was out of town, and did not come till the following Tuesday. Only one visit. There was some question as to circumcision, which was done some time in September. There was no paralysis, and no further symptoms. In October the child again had fever, vomiting and was dull. Seen by physician three times.

This woman keeps about 15 chickens. An indefinite time before case 18 was taken ill 2 of the chickens died, one about two weeks after the other. The deaths were sudden, and the chickens were previously well so far as known.

Case 19.

I. C., four years, 3 Gilliad Street, Adams. Dr. A. K. Boom, Adams. August 30 taken ill with fever and vomiting. On September 1, paralysis both legs and right arm. Constipated.

One other child, ten years, at French parochial school, grade 3. Father works at L. L. Brown Paper Company, lower mill. Mother works at spinning, Berkshire Mill No. 3. The children in this family had no contact with a small child upstairs, though they now stay there while the parents are at work.

Case 20.

R. P., two years, 16 Temple Street, Adams. Dr. J. H. Choquette, Adams. Illness began with fever, slight retraction of head and pain in neck on September 8, followed by headache and paralysis of right arm on September 10.

There are 2 other children, older; 1 in school at Commercial Street, grade 2, though school did not begin till September 13. The father works as a trimmer in the upper mill of the L. L. Brown Paper Company.

Case 21.

P. P., three years, 143 Bellevue Avenue, Adams. Dr. A. K. Boom, Adams. On September 26 taken ill with fever, tenderness in the legs and some pain in the neck. Constipation. On September 28, paralysis in both legs. Retention of urine for twenty-four to thirty-six hours.

One other child, older, attending the Maple Grove School, grade 2. Father works for Renfrew Manufacturing Company as a painter. No known contact with other cases.

Case 22.

J. F. N., four years, 48 Maple Street, Adams. Dr. J. H. Choquette, Adams. In April had what attending physician said was eczema, but what Dr. Boom, who was called in, said was scarlet fever. Child peeled. There was subsequent weakness in walking. Just two weeks before J. was taken ill, the father was sick with grippe, and consulted the same physician at the *latter's office*. The physician was not in the house for at least a month before this illness began. Illness began October 22, with fever and headache. Vomited once on following day, at which time appeared paralysis of the right arm. There was also some pain in the neck and tenderness in the right arm. There was also a mild tonsilitis at this time. Constipated.

There are 2 younger children; none in school. Father employed as clerk in drug store. There are 2 French children in the family downstairs.

Case 23.

R. D., five years, 53 Spring Street, Adams. Dr. A. Desrocher, Adams. Illness began October 21, with fever, some pain and tenderness in the legs. On October 24 woke crying, and said he could not move. Brought downstairs and dressed, but was inclined to lie in a chair for this and the follow-

ing days. On October 25 woke crying again, and said his "legs were gone." Later he got about by placing his hands on a chair and hopping. This continued for ten or twelve days, and disappeared gradually by the end of a month.

There are 2 younger children. This boy attended school at Liberty Street, grade 1, from which room there was another case (24) on November 2.

The school record of attendance shows as follows: this boy was first out on October 25, whole day; was in in the afternoon of the 26th of October, and then out rest of the week. The following week was in from November 1 to 4, inclusive, then permanently out. From which the inference is that the dates as to the onset of the illness are not entirely accurate, though the facts stated are correct.

Early in August he was on a farm in Savoy, near the Harris farm (see case 28), whence he returned at the end of August. During the stay in the country he visited the Harris farm and saw the patient there after she had been taken ill. The interval before his own illness is too long to make this likely as the source of his infection. This boy frequently played at his father's livery stable, where he may have come in contact with the grandfather of case 20 (taken ill September 8), though the interval here seems long to trace the infection thence. The grandfather and case 20 were in frequent contact.

Case 24.

J. C., six years, 17 Randall Street, Adams. Dr. A. J. Bond, Adams. Taken ill November 2, with fever, possibly some headache. Paralysis of both legs on November 4.

Attended Liberty Street School, grade 1, where he was in possible contact with case 23 on November 1, and during the preceding week. No other cases occurred in this school.

There are 5 other children, 2 of whom attend the same school, grades 4 and 9. They lost no time from school during the whole of the brother's illness. Father is a master plumber.

Case 25.

F. B., twenty-seven months, 18 Pine Street, Adams. Dr. A. K. Boom, Adams. November 4, taken ill with fever and slight tenderness in left leg. On November 5, paralysis in lower part of left leg.

One younger child. Father, mule spinner, Berkshire Mill No. 4. No known contact with other cases. An English family, here only a few months, not acquainted much as yet.

Case 25A.

H. W., twenty-one months, 76 Friend Street, Adams. Dr. H. B. Holmes, Adams. During late summer and early fall had stomach trouble. Taken ill after November 5, with fever and vomiting. Constipated. No special pain. Two weeks later, about November 19, had paralysis of both legs. Still (Feb. 15, 1910) unable to walk.

Six other children in family, 2 in Renfrew School, grades 4 and 5. Possible contact with case 17B, next door, through the children who played together. Father works in cloth room, Mill No. 4, Berkshire Mills.

Case 26.

A. T., four years, 13 Enterprise Street, Adams. Dr. J. H. Choquette, Adams. December 4, fever (104°), delirious and pain in the neck and right hip and leg. Vomiting. Constipation. December 5, paralysis of right leg.

Brother of case 27.

Case 27.

C. T., twenty-one months, 13 Enterprise Street. Dr. J. H. Choquette, Adams. Taken ill December 7, with fever (102°), slight retraction of head, some pain in the back and legs.

December 10, paralysis of both legs and the right arm.

Sister of case 26.

Ten other children, older, in the family at home. Some attend the parochial school and some work, but there is no known contact, either direct or indirect, between these cases and others. This is probably a contact infection from the first case in the family.

Case 28.

E. H., five years, Brier, Savoy. Dr. W. W. Pascoe, Savoy. Taken ill August 1, and on August 3 had fever, vomiting, slight sore throat, pain and tenderness in the leg. No marked paralysis, but rather weakness in legs.

A brother, fourteen years, had a similar attack at five years of age. Now has marked atrophy of left leg. No known contact with other cases previously (see case 23).

Case 29.

M. J., three years, Plainfield. Dr. W. W. Pascoe, Savoy. Entirely well, living remote from neighbors, was taken ill on September 22, with fever, delirium and pain in the back. Also had *nosebleed*, vomiting and diarrhœa. On day of onset had made a trip to Adams with her mother, but so far as known came in no contact with any Adams case. On September 26, paralysis of both legs and some difficulty in voiding urine.

The following case is the child's father.

Case 30.

H. J., thirty-three years, Plainfield. Dr. W. W. Pascoe, Savoy. This patient, father of the preceding, was ailing at the time his daughter was taken ill, or even a day or two before, but he did not give up till September 29, when he had fever, nosebleed, pain in the neck and delirium. There was retention of urine, paralysis of both legs and both arms, and partial paralysis of right side of the face. There was also disturbance of the

respiratory muscles. At the present time he is in a Springfield hospital, and is only now (December 24) beginning to move his toes.

Some time previous to the illness he drove several horses over the road to Springfield, being absent three or four days. So far as known he came in contact with no other cases. On August 16, the patient's father, who lived with him, died of heart disease. The funeral, a day or two later, was conducted by a minister from Cummington, whose child was ill at the time with infantile paralysis. Here is a possibility of infection through a third party, though the interval between exposure and onset is considerable.

Beside the daughter above mentioned, there are 2 other children in the family, one younger, one older.

Summary, Pittsfield and Vicinity.

In point of time the Pittsfield cases were much more closely grouped together than in the other communities, with the exception of Great Barrington.

Between July 14, previous to which date there was 1 case (case 31, June 22), and September 9, 14 cases occurred, 10 of which were in August. In October there were 3 cases (case 46 on October 8, case 47 on the 27th, and case 48 in Richmond on the 28th).

Paralysis, in every case involving the legs, was present.

There was but 1 case in a household. There were no suggestive abortive cases.

It is worth noting that here again the large majority of the cases are located near or comparatively near the Housatonic River.

While in one locality 6 cases occurred moderately near each other, on June 22, July 19, August 7, 14, 15 and 20 (cases 31, 34, 36, 37, 38 and 40, respectively), the fact that all of the patients were but three years old or less makes the likelihood of contact between them exceedingly slight. The history of these cases also discloses no evidence of contact.

Another group of cases, in the southern and western part of the city, on July 14, 17, August 15, 21 and 22 (cases 32, 33, 35, 39, 41 and 42, respectively), show equally slight probability of contact, except that case 35, in an Italian family, and case 39, in a Jewish family, opposite each other on the same street, may have been in indirect contact through other children in the family.

Otherwise there are no known points of contact between the different cases.

In all but three instances there are other children in the family of the patient.

That the schools had no part in occasioning the spread of the disease in Pittsfield appears from the fact that but 3 of the cases occurred after the opening of the schools, on September 7.

In but a single instance did a patient attend school (case 45, September 9).

Nor in any instance save one were children from the households of patients attending the same schools. In this instance (case 45, just mentioned, and case 46, October 8) the children were in different rooms, while the interval of nearly a month since any possible indirect contact speaks strongly against infection from this source.

The 18 cases were attended by 10 physicians. One physician attended 5 cases at an out-patient department. Another physician attended 3 cases, and 2 others 2 each.

There were no cases in physicians' families, though in three of the families there are children.

In no instance is there record of the physician having recently visited the family of the patient previously to being called to attend the patient himself.

Five of the cases (case 32 July 14, case 33 July 17, case 41 August 21, case 45 October 9, case 47 October 27) are either on the line of the electric cars, or very near on side streets leading from the car line. None of the cases, with the exception of those just mentioned and one or two others, are on streets frequented by automobile tourists.

Five or 6 of the cases are near the railroad, 1 of them near the station.

Case 31.

W. P., two and one-half years, 86 Danforth Street, Pittsfield. Dr. F. S. Coolidge, Pittsfield. Taken ill about June 22. Fever very slight, if any. There first appeared a weakness of the right leg, which gradually increased, till at the end of a fortnight there was complete paralysis of the right leg. This persisted for two weeks, and then gradually disappeared, full recovery being noted early in August.

One younger child. No school. No acquaintance with other cases. Father employed at Elmhurst Farm.

This was the first Pittsfield case.

Case 32.

L. L. S., twenty-two months, 59 Harris Street, Pittsfield. Dr. J. D. Howe, Pittsfield. Some time in June visited in Adams, on Elm Street, in the same neighborhood where later were cases in Adams. While there played in hot sun. June 12 had a burn of the right leg. Recovery. Taken ill with general gastro-intestinal symptoms on July 14. Fever was observed on July 19. Pain and tenderness were general over the whole body. There was suppression of urine on July 24, and two days later, on July 26, there was paralysis of both legs.

Second case in Pittsfield, in a totally different part of the city from the preceding.

Other children in the family. No school at this time.

Case 33.

J. E. B., seventeen months, 219 New West Street, Pittsfield. Dr. Mercer, Pittsfield. Was ailing somewhat for one or two days previous to the onset of the fever, on July 17 or 18. The doctor was called, and for a day the patient seemed better. Then the fever returned. There was retraction of the head, considerable pain and tenderness in the back. Also some general twitching on the first day. On July 21 there was paralysis of both legs. No bowel disturbance, no vomiting.

Three other children in the family. No school at this season.

Case 34.

E. G., two and one-half years, 130 Madison Avenue, Pittsfield. Dr. J. A. Langlois, later Dr. G. E. Reynolds, Pittsfield. Taken ill between July 19 and 26, feeling dull and weak in the legs. At the same time paralysis of left leg appeared.

Seven other children in family; oldest is 19 years, employed at Eaton, Crane & Pike's; others work in Musgrove Knitting Company and Stanley shops. There are 5 children in the opposite side of the house, with whom these children were in more or less contact. No school at this season. No apparent contact with other cases.

Case 35.

K. T., two years, 34 Jordan Avenue, Pittsfield. Dr. W. A. Millett, Pittsfield. Taken ill in August, with fever, stiffness of the neck and some pain in neck and legs, which continued for a week. Three days after the onset paralysis of both legs occurred, of such degree that the patient could not walk for four weeks. For two days he was unable to void.

Two other children in the family. No school. Case 39, taken ill August 15, lives on the opposite side of the street. There are children in this family as well, and notwithstanding the difference in nationality (Jews and Italians), it is conceivable that the other members of the families were in contact.

Case 36.

R. H., three years, 94 Turner Avenue, Pittsfield. Dr. G. E. Reynolds, Pittsfield. Taken ill August 7, with fever, pain in back and neck. Constipated. On August 10, paralysis of left leg, the right leg also becoming paralyzed afterwards.

One younger child in family. No school. No contact known with other cases. They are acquainted with the family of case 31 (taken ill June 22). No history of visits.

Case 37.

R. F. S., two years, 108 Linden Street, Pittsfield. Dr. Mercer, Pittsfield. Taken ill on August 14, with fever, some pain in back and neck. On August 15, paralysis of both legs. Constipated. Retraction of head for five days.

One other child in family. The patient had been to moving pictures with his mother several times. No school. Case 34 (taken ill July 19) is near by, but there is no history of contact between them.

Case 38.

D. K., twenty-two months, 52 North John Street, Pittsfield. Dr. F. S. Coolidge, Pittsfield. Taken ill about August 15, with fever, pain in neck and vomiting. On the following day there was paralysis of both legs, the left leg worse. Constipation.

Three other children in family, 2 older, 1 younger. No school. The parents are acquainted with the families of cases 39, 40 and 43, taken ill August 15, 20 and 25, respectively, two of them Jews. But with one family (case 39) there is no social or other relations, and with the others there was no contact until they were brought together after the occurrence of the disease. Father deals in junk.

Case 39.

D. H., eleven months, 37 Jordan Avenue, Pittsfield. Drs. England, Langlois, Coolidge, Pittsfield. Taken ill about August 15, with fever, drowsiness and soreness in the back. Three days later there was paralysis in both legs, the left leg worse.

Seven other children in the family. No school. Father is a junk collector. They know of no other cases except the Italian child on the opposite side of the street (case 35).

Case 40.

B. K., twenty months, 273 Dewey Avenue, Pittsfield. Dr. F. S. Coolidge, Pittsfield. The parents were informed that a few days before the onset of the illness the baby had been thrown from the baby carriage. The baby showed no evidence of it. Without preliminary symptoms the child's leg (left) was found to be paralyzed about August 15.

No known contact with other cases till some time later. There are other children in the family.

Case 41.

E. F., two years, 18 East Mill Street, Pittsfield. Dr. G. P. Hunt, Pittsfield. For two weeks, while company was in the house, the child had been out in the sun a good deal, and when she became feverish, on August 28, mother thought it might be due to exposure and fatigue. On September 2 appeared paralysis of the lower part of the left leg and the left arm.

An only child. No known contact with other cases. This house is situated close to a millpond, and on the opposite side of the pond, a short distance away, is case 32, taken ill in June.

Case 42.

A. R., three years, 194 Wendell Avenue, Pittsfield. Dr. J. B. Thomes, Pittsfield. On August 22, languid with fever (103°). On August 25, possible slight paralysis of right leg, but well-marked paralysis of left leg. Involuntary urination on the night of August 25.

One younger child in family. No school. No contact. An unusually well-appointed home, of the best class.

Case 43.

I. Y., two and one-half years, 130 Lincoln Street, Pittsfield. Dr. J. A. Langlois, Pittsfield. On August 22, a slight fall, nothing to it. Fever on August 25, accompanied with retraction of the head, stiffness of neck and pain in left hip and leg, continuing till September 1, when paralysis appeared in the right leg. For a week following the appearance of the paralysis could not retain the contents of the bowel or bladder.

Five other children in the family. No school at this time. The family moved here one week before the illness began, coming here from a concrete house on South Onota Street, near the Housatonic River, not far from Jordan Avenue (cases 35 and 39).

Case 44.

D. M., nineteen months, 6 Atlantic Avenue, Pittsfield. Dr. F. S. Coolidge, Pittsfield. August 29 had vomiting and fever, also pain in left leg. On September 1, paralysis of left leg.

No known contact with other cases. Family not acquainted with other Italian case (case 35), which is in another part of the city entirely. Two older children. No school at this time; Linden Street since. Many Italian laborers board here.

Case 45.

E. C., nine years, 13 Mellville Street, Pittsfield. Dr. G. E. Reynolds, Pittsfield. From July 29 to August 25 was with his mother in Bennington, Vt., staying in a pleasant house in the high part of the town. Returned to Pittsfield on August 25, on an electric car, and may have been chilled. Stayed a few days after his return on Curtis Terrace, Morningside, before the house here was settled. Had headache for two or three days before the onset of fever, on September 9. Vomiting for two days and delirium. Constipated. On September 10, paralysis of both legs and both arms. Still unable to use legs; arms much improved (December 2). About the middle of November had severe choking attack, of half hour's duration.

Attended Orchard Street School, grade 5.

Case 46.

C. W. N., thirty-five years, 85 Maplewood Avenue, Pittsfield. Dr. A. C. England, Pittsfield. Was in Albany on October 8, marching with the militia at the Hudson-Fulton celebration. That evening he stumbled on the street, but did not fall. There was immediately a severe pain in the left leg and shin, so that he had difficulty in returning to Pittsfield. Fever and pain continued in the leg for one week. Redness appeared over the tibia, suggesting periostitis. A low leucocyte count prevented operative treatment. With the development of paralysis in the left leg on October 15, the acute symptoms abated.

The man is a plumbing contractor, with business largely in the shop and office. There is history of contact with an old case of two or more years' standing.

Case 47.

H. C., nineteen years, 350 Wahconah Street, Pittsfield. Dr. J. A. Langlois, Pittsfield. Suddenly, on arising on morning of October 27, found he could not use the left leg as usual. Fell two or three times attempting to get about the house. Unable to raise toes. Returned to work in draughting department at Stanley shops after two days. Walked by raising the left foot high enough so as not to strike the toes.

Two other children in the family, 1 in business college, 1 in first year at high school. A case of two years' standing or more in a neighboring French family.

Case 48.

W. H. W., nineteen years, Richmond. Dr. W. W. Leavitt, Pittsfield. Had been working for two months on a farm in West Stockbridge at the time illness began. He had been ploughing for three days, when on October 28 he had backache, gradually increasing in severity during the day. He also had moderate fever, headache and some stiffness in the neck. On the following day there was paralysis of both legs, and inability to void urine. He was also unable to retain an enema. On this day he was removed to his own home in Richmond. He was stung once or twice by yellow jackets before he was taken ill.

An intimate chum of his had an attack of this same trouble two years ago. They were last together on October 18.

SUMMARY, LEE, LENOX AND STOCKBRIDGE.

There were 2 cases in Lee, 1 on October 3 (49), in South Lee, a fatal case, and the other in Lee a month later, on November 4 (50). The history of these cases does not disclose any possible contact with other cases.

There were 6 cases in Lenox. Isolated cases occurred April 12 (case

51) and June 23 (case 52), at a time when hardly another case was known in the county.

On September 22 occurred another case (53). This child, at school during June, played with case 51, ill in April, and just recently, since the opening of the schools, walking to school, had been in contact more or less with a sister of case 52 (ill in June).

Case 55, October 1, is apparently an isolated case, that of a two-year-old infant, living in the country, at New Lenox. During August the infant was with its mother in Pittsfield for one day. There was no known contact with other cases. This case is close to the electric railway, also near the railroad.

The 2 remaining cases, 56, October 17, and 57, November 15, are situated near the electric and steam car lines, near the Valley Paper Mill, at Lenox station and Lenoxdale, respectively.

The mother of the latter patient visited the preceding case, held the baby who was ill and kissed it, about a month before her own child developed the disease. The mother's sister, aunt of the latter case (57) acted as nurse for the preceding case (56), and during the time that she was so engaged she visited in the home of this patient at least once after the visit of the mother, above mentioned. This would seem to account for the infection of the second case.

Case 58 and case 59, brother and sister, in Stockbridge, were taken ill on the same day, October 10.

Two days previously the sister went with her parents to Albany and return, by automobile. On October 9 there was some malaise, and on the 10th she was taken ill, almost at the same hour as her younger brother.

She speedily recovered after five days in bed, and may possibly be regarded as an abortive case.

Aside from possible contact with a case in Stockbridge of two or three years' standing, there was no known contact, direct or indirect, with other cases.

Case 49.

I. V., nine years, South Lee. Dr. Markham, Lee. Ill October 3, with fever and pain in the back. Later there was pain in the neck, arms and legs. On the third and fourth day there was vomiting. Bowels constipated. On October 8 the paralysis appeared in the right leg, then in the left leg; and on the following day in the left arm, then in the right arm. Later in the day the patient died, with paralysis of respiration, the throat muscles being involved also.

There are 3 other children in the family. After the first three or four days they were kept apart from the patient. The children attended school in South Lee. This was the only case in South Lee.

Case 50.

J. B., eight years, 34 Prospect Street, Lee. Dr. J. J. Hassett, Lee. On November 4 had fever, headache and vomiting, also some diarrhœa. On November 6 occurred paralysis of the right arm and forearm. Pain and tenderness in the arm became very severe on November 8.

Patient attended the parochial school. Five other children in the family. This was the second of the 2 cases in Lee, and was in no way connected with the former. No known contact, direct or indirect, in either of the cases.

Case 51.

P. J., five years, Fairview, Lenox. Dr. Hale, Lenox. This is apparently an isolated case, occurring in the central portion of the town early in April. There may have been some exposure to cold a few nights before while watching a large fire. About April 12, fever began. About April 26, when paralysis of both legs occurred, the flesh was sore to the touch, the bones ached, the boy was listless and wanted to be held. Diarrhœa was present early.

A sister, eleven years, in the family. No known contact with other cases.

Case 52.

W. K., three years, Depot Street, Lenox. Dr. F. A. Roberts, Pittsfield. This, the second case in Lenox, also appears to be an isolated case. On May 29 mother thought the child was about to have a convulsion. On following day mouth and throat were sore. On June 2, the glands in the neck were swollen and so continued for two days. The first symptom of paralysis noted was on June 23, when the child began talking through the nose. Dr. Hale was called and thought of adenoids. On June 25 or 26, paralysis appeared in both arms and both legs. He was also unable to hold his head up.

Three other children in the family. No school at this season.

Case 53.

E. M., twelve years, Cliffwood Street, Lenox. Dr. A. C. England, Pittsfield. On September 22, had fever and some pain and tenderness in the right leg, which became paralyzed on the evening of the same day.

Patient attended the Center School, and played with case 51 (April) in June, and just recently walked to school with a sister of the preceding case (52, June 29). No other contact known.

Case 54.

E. H., Dr. J. J. Hassett, Lee. This case omitted from the summary, because it is now said to be a case of hip disease (Feb. 10, 1910).

Case 55.

E. P., two years, New Lenox. Dr. I. S. F. Dodd, Pittsfield. An isolated case in the country, near an electric car line. In August the child was one day in Pittsfield with its mother. October 1, some pain in the head, face, and on October 2, paralysis of both legs, slight in the left. Constipated.

Two other children in the family; 1 in school.

Case 56.

J. T. C., eighteen months, Valley Mill, near Lenox station. Dr. J. J. Hassett, Lee. An isolated case near the electric and steam railways. Fever appeared on October 17. On following day was paralyzed in both legs. There was constipation, and some pain in the left leg, which was the worse.

An only child. No other case near except the following (case 57).

Case 57.

G. L., two years, Lenoxdale. Dr. J. J. Hassett, Lee. Fever up to 102.5° on November 16. On following day pain in the back and paralysis in both legs. Constipation. Mild case.

An only child. On line of electric and steam cars. The child's mother visited the preceding case (56) at Lenox station, held and kissed the baby, who was then ill, about a month before her own baby developed the disease. This baby's aunt, who assisted in caring for the C. baby (case 56), was also here at least once during her stay at the child's home. This is the only known contact with other cases.

Case 58.

L. B., two and a half years, Stockbridge. Dr. J. R. Hobbie, North Adams. Taken ill on October 10, with fever and considerable pain, apparently due to retention of urine, which continued for forty-eight hours. There was some retraction of the head. Constipation. On October 12 there was paralysis of the right leg.

A brother of case 59.

Case 59.

A girl, B., eight years, Stockbridge. Dr. J. R. Hobbie, North Adams. On October 8 went with her parents in an automobile to Albany to see the Hudson-Fulton celebration. They returned the same day. On the following day she did not feel well. On the 10th of October, almost at the same hour as her brother, she had fever, and felt as if she could not move. Her head was retracted somewhat. She was in bed for five days, for two days was unable to move her legs. She recovered speedily.

There is in the same town a case of two or three years' standing, with which there may have been some contact.

Summary, Great Barrington and Vicinity.

In this group were 23 cases.

The first cases occurred in the country, near each other, on August 11 (case 80) and August 20 (case 81) in Sheffield and Egremont, respectively.

The 19 cases in Great Barrington occurred during September and the first week in October.

Two cases in Austerlitz, N. Y., included in this group, occurred on September 28.

In 18 cases there was paralysis.

Of the 5 cases which did not have paralysis, 3 were abortive (62, 69, 79), and 2 had paresis of both legs (70, 71).

Nearly all of the cases in Great Barrington (16 out of 19) are located immediately upon or quite near the Housatonic River, 4 being on the west and 15 on the east side of the river.

The 4 cases on the west side of the river, 64, 68, 69 and 71, on September 19, 22, 24 and 25, respectively, are well scattered.

These cases seem to have had no association with each other in any known manner, unless the possible indirect contact between case 68 (September 22), who was a first-year student in the high school, and case 69 (September 24), whose brother was in the eighth grade in the same building, be considered. Case 64 (September 19) was an only child, who had not been in school during the current school year.

This last case, and case 71 (September 25), had possible contact with cases on the opposite side of the river, as will appear later.

On the east side of the river were 15 cases, 10 of which were located on East Street and Avery Lane, practically a continuation of East Street. The 5 remaining cases were on cross streets near East Street.

From three households where were cases (61, 70, 72); no members attended school.

Cases 61 (September 8) and 72 (September 25) lived in adjoining houses some 200 feet apart, at the south end of East Street. There was more or less indirect contact between these 2 cases, because the second case visited the neighbor's child after it was ill, but she did not go into the house, though her sister did go into the house and assisted at times in caring for the first patient.

The source of infection for case 61 is not evident, though for one or two unlikely possibilities reference is made to the special notes on the case.

Case 70 (September 14) was an only child of three and one-half years, daughter of the man for whom case 72 worked as bookkeeper. It was

said that the latter had visited and held this child after it was ill, but this statement could not be verified. This child played much with a neighbor's children, one of whom attended the Bryant School, grade 2. There were no cases in this school.

Case 67 (September 22) was employed in a cotton mill, where were no other cases. A sister attended the eighth grade at the high school building, where the brother of case 69 also attended, with case 68 in the first year of the high school. There is no history, however, of any acquaintance or association other than the most casual between the one patient and the members of the other two households.

The group of cases (5) in Avery Lane, at the northerly part of the district, might readily be considered as contact cases, from association with each other, due to proximity, but further study of the matter makes it probable that they belong to a larger group, associated somewhat loosely with the Justin Dewey School.

To this group belong the 11 remaining cases on the east side of the river and cases 64 and 71 on the west side of the river. The details are as follows: —

The schools opened on September 7, and sessions continued through Friday, September 24, when a recess was taken for a week, on account of the Great Barrington fair. School work was resumed on Monday, October 4.

Whenever school is mentioned below, it refers to the Justin Dewey School.

Case 60 (September 3) did not attend school, but a brother regularly attended the fifth grade, while a brother and sister attended the fourth grade regularly.

Case 62, an abortive case, taken ill on September 16, attended school, grade 2, on September 7 and 8. She was then out till October 18. A sister attended the eighth grade regularly.

Case 63, a brother of the foregoing, became ill on September 23. These two children slept in the same bed with the mother, and the brother, who was four years of age, probably received his infection from the sister.

Case 63A (September 16) did not attend school, but two sisters did, one in the third grade and one in the second grade, and they were regularly present from the opening of the session on September 7. There was also contact with case 60, because the families lived in closely adjoining houses, and the children played together considerably.

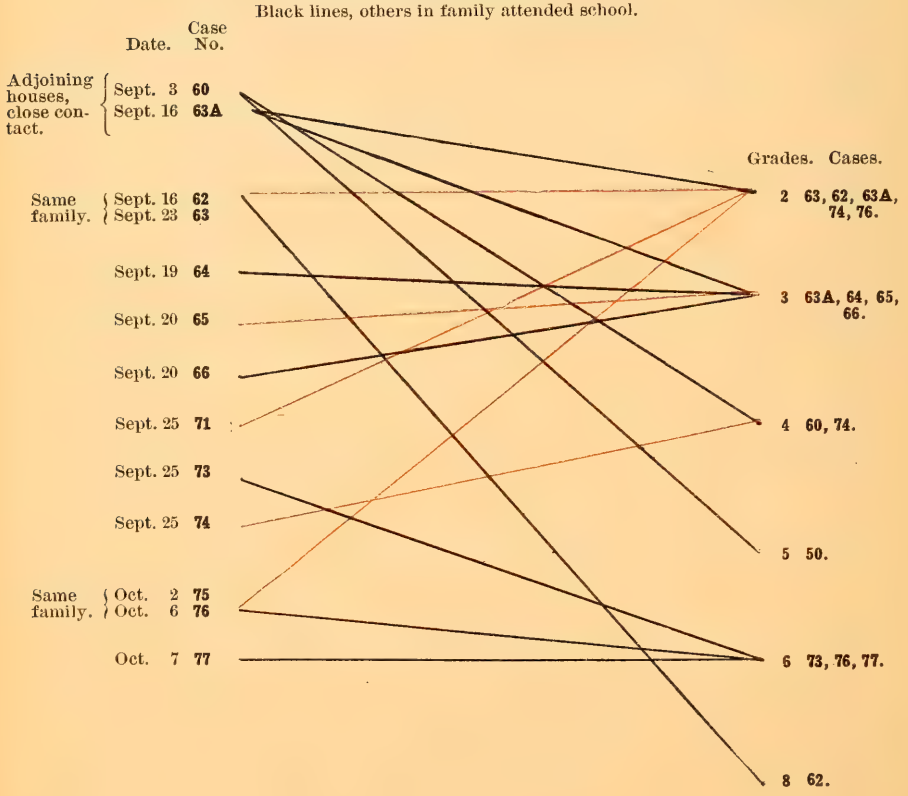
The teacher in grade 3 is an aunt of case 64, September 19, and is accustomed to seeing her niece (case 64) frequently.

Case 65 (September 20) attended grade 3 till September 22.

Case 66 (September 20), an infant, had a brother who attended grade 3 regularly.

DEWEY SCHOOL CASES, 1909.

Red lines, patient attended school.
Black lines, others in family attended school.



Case 71 (September 25) attended grade 2 till September 24.

A boy in the family of case 73 (September 25) regularly attended grade 6.

Case 74 (September 25) attended grade 4 regularly till September 24. He returned to school October 19. A brother of this patient attended grade 2 regularly.

Case 75 (October 2) had a brother, case 76 (October 6), who was in school October 4 and 5 after the recess for the fair. Another child, of whom there are 12 in this family, attended the sixth grade regularly.

A sister of case 77 (October 7) attended grade 6 regularly.

Thus between September 16 and October 7, 13 cases are associated directly or indirectly with the Justin Dewey School.

The diagram illustrates the distribution of the cases.

The 23 cases were cared for by four physicians. One physician had 10 cases, one 8, one 3 and one 2 cases.

Three of the physicians have families and children. There were no cases in physicians' families.

The physician who had 10 cases, after being called to his first patient, visited two families where infantile paralysis occurred subsequently. These calls were on chronic cases of other illness, and he did not come in close contact, if, indeed, he even saw those who had anterior poliomyelitis later. Further, in each of these two instances there were other possibilities of direct contact with other cases of the disease.

Another physician, who between September 19 and 29 saw 8 cases, had not been in any of the homes in question for a considerable period until called for the present illness.

Only 3 of the cases are on the line of the electric railway or the route taken by automobiles in passing through the town, though 5 other cases are quite near.

Only 1 case is close to the line of the railroad.

Case 60.

E. C., six years, East Street, corner Cottage Street, Great Barrington. Dr. M. T. Cavanaugh, Main Street, Great Barrington. On September 2 was observed to limp slightly when walking. On the following day had fever (100° to 102°), vomiting, and pain in leg and knee. On September 6 there was paralysis of the left leg.

There are 5 other children in the family. This child attends the Dewey School, grade 2, though he did not enter this year until October 18. Two or three of the other children attend the same school, up to the fifth or sixth grade. J. in the fifth. Father is a lineman for the Great Barrington Electric Light Company.

Case 61.

M. F., two years, 215 East Street, Great Barrington. Dr. M. T. Cavanaugh, Main Street, Great Barrington. Fever (102°) began on September 8, accompanied by some delirium; would not stay in bed; once fell to floor. A week later, on September 15, there was paralysis of both legs, left arm and left face. There was some retention of urine for nearly twenty-four hours. No evidence of paralysis now present (November 3). One other child, of four years of age, occupied the same bed with the patient throughout the whole illness, and still continues to do so.

The F. case (72, September 25) lives a short distance away in the adjoining house.

The Sheffield case (80, August 11) is a cousin of this boy's mother, but there had been no communication between the families for a long period prior to this child's illness.

A cousin's child on the father's side had an attack of this same disease in Sharon, Conn., early in the spring. Between these families there is a regular exchange of letters, with which this baby may have played.

Case 62.

E. O., seven years, 72 State Road, Great Barrington. Dr. M. T. Cavanaugh, Main Street, Great Barrington. Taken ill on September 16, with fever, headache, pain in back of neck, lower part of back and leg ache. Slight sore throat. Pain in legs and ankles continued for two or three days. Well since.

Attended Dewey School, grade 2. Entered on September 7. Beginning September 9 was out continuously to October 4, when she returned to school.

Sister of case 63.

Case 63.

J. O., four years, 72 State Road, Great Barrington. Dr. M. T. Cavanaugh, Main Street, Great Barrington. Taken ill with fever (104°), vomiting and pain between the shoulders on September 23. Constipated. On September 26 or 27, paralysis of both legs.

This child and sister, above mentioned, slept in the same bed with the mother.

There are 2 older girls in the family who are not in school.

Case 63A.

D. G., four years, 6 Cottage Street Extension, Great Barrington. Dr. M. T. Cavanaugh, Main Street, Great Barrington. For two or three weeks before onset of illness, on September 16, complained of feeling tired, especially in the legs, on walking. On or about September 16 had high fever, was dull and quiet, and wished to be let alone. There was pain under the left knee. About September 26 there was paralysis of the extensor muscles of the left

leg; patient could not straighten out the left leg. Later she was unable to stand on that leg for several weeks. Now (April 5, 1910) quite well, except that she has less endurance than before.

Case 64.

H. M., six years, 34 Castle Hill, Great Barrington. Dr. Bebee, Main Street, Great Barrington. One week before illness was operated on for adenoids and tonsils at home, by Dr. Blanchard of Pittsfield. Two days before had a slight fall, no ill effects so far as known. Taken ill with fever and vomiting; was dull and sleepy on September 19, and on the following day there was paralysis of the left leg, of mild degree.

No other children in the family; not in school this year.

An aunt, teacher in Justin Dewey School, grade 3, is a frequent visitor.

Compare with case 78, last paragraph.

Case 65.

G. J. F., seven years, 41 Russell Street, Great Barrington. Dr. M. T. Cavanaugh, Main Street, Great Barrington. No previous illness, except that two weeks before did considerable running and racing at school. On September 20, headache, also fever, which continued to September 26. From the 21st to the 24th he was delirious. On September 22, vomiting and paralysis of both legs. Diarrhœa was present one day. Apparently recovered by October 11.

No other children. Attended Dewey School, grade 3. Was out of school from September 22 to October 17, inclusive.

Case 66.

M. E. W., fourteen months, 63 East Street, Great Barrington. Dr. Bebee, Main Street, Great Barrington. Became ill with fever on September 20. Vomiting followed dose of castor oil. September 24 discovered that there was paralysis of both legs, the right more severely.

An only child. No known contact with other cases.

Case 67.

H. D., sixteen years, 49 Cottage Street, Great Barrington. Dr. Bebee, Main Street, Great Barrington. On September 22, medium headache, loss of appetite, malaise and slight fever. Considerable pain in lumbar region and in legs. On September 25, 26 and 27, vomiting. On September 26, paralysis of right leg, and paralysis of left leg on September 28.

Two other children in the family; none in school. This girl worked in the finishing room at the Edgemere Manufacturing Company (spreads).

Case 68.

D. B. R., fourteen years, 12 Barrington Place, Great Barrington. Dr. C. H. Chapin, Main Street, Great Barrington. On September 22, vomiting,

which continued all of the following day, when fever appeared (102° to 103°). On the evening of September 24 appeared paralysis of both sides of the face. On the 25th there was delirium, later dullness, gradually increasing till patient became comatose, death taking place on September 27. On September 25 there was paralysis of the labio-glosso-pharyngeal muscles, so that the jaw dropped and he could not put it forward. During the last twenty-four hours there was incontinence of urine and feces.

He was a first-year student in the high school, at Searles Building. Other children in family; none in school.

Case 69.

J. R., five years, 31 Dresser Avenue, Great Barrington. Dr. Bebee, Main Street, Great Barrington. On September 24, considerable fever. On 25th, headache, and on 26th gradually became completely unconscious, which condition lasted till the following day, nearly twenty-four hours in all. Rapid recovery followed.

A brother attends the eighth grade at high school, Searles Building. Two other boys in the family.

Compare cases 78 and 79.

Case 70.

A. H., three and a half years, 135 East Street, Great Barrington. Dr. Bebee, Main Street, Great Barrington. This child, with its mother, was in Pittsfield on July 4. About September 14, without initial fever, there was noticeable lameness of the left leg, followed by a similar lameness in the right leg. On September 18 there was tenderness about the neck and arms, later in the legs. On September 20 vomiting began, which continued through the following day.

An only child. Played intimately with children on opposite side of the house, kissing the baby frequently. Case 72 (Sept. 25) was employed as bookkeeper by this child's father. No source of infection known.

Case 71.

G. B., seven years, 87 Railroad Avenue, Great Barrington. Dr. Bebee, Main Street, Great Barrington. Some fever and vomiting on September 25. Better the following day and went to church. On the 28th he went to the cattle show. On September 29, again had slight fever, headache and stomach ache. On September 30, paresis of right leg.

Only child in family. Attended Dewey School, grade 2, till September 24, then out till October 26. At Dewey School in possible contact with cases 60 and 76.

Case 72.

K. F., twenty-five years, 225 East Street, Great Barrington. Dr. M. T. Cavanaugh, Main Street, Great Barrington. On evening of September 25, vomiting. On 26th and 27th very nervous. On 28th seen by physician.

She had little or no fever. She was not seen on the 29th. On the 30th he found her sitting up, but in appearance severely ill, with an acute infection; the mouth was dry, there was sordes on the teeth. No fever. She could move the right leg with great difficulty only. Later, the right arm and the right leg were paralyzed. On October 1, delirium appeared and continued for three days. On October 4 was unable to articulate distinctly, but the condition improved on the 5th and 6th. At that time (October 6) there was slight difficulty in swallowing, and on the night of the 6th of October patient died, with evidences of respiratory paralysis.

Was said to have seen her employer's child (case 70, September 14) a few days before her own illness. This however, is said not to be so by the latter's family. She went also to the house of case 61, living in the next house, some distance away, but did not go in. Her sisters, however, did go in, and one of them helped care for the child and kissed him. The patient, however, had a room to herself.

Case 73.

H. C., fourteen months, 32 Avery Lane, Great Barrington. Dr. M. T. Cavanaugh, Main Street, Great Barrington. A mild case, taken ill on September 25 or 26, with drowsiness and fever, pain in the legs. Previous to this time the baby crept and would take a few steps. With the onset as above described was unable to do either. On October 10, began again to creep slightly.

Other children in family. One boy is in Dewey School, grade 6. Cases 74 to 77, inclusive, in the immediate neighborhood.

Case 74.

H. H., ten and one-half years, 16 Avery Lane, Great Barrington. Dr. C. S. Chapin, Main Street, Great Barrington. Early in September had a slight headache and some fever for two days. On September 28, fever, with some delirium for the first night, headache, nausea and some soreness in lower part of back and right leg. On October 5, paralysis of right leg. Slight disturbance of left leg for one day.

Attends the Dewey School, grade 4. Was out from September 24 to October 19, inclusive. A brother attends same school, grade 2, and had no absences. Cases 73 and 75 to 77, inclusive, in the immediate neighborhood.

Case 75.

E. C., twenty months, 29 Avery Lane, Great Barrington. Dr. M. T. Cavanaugh, Main Street, Great Barrington. On October 2 walked poorly. On October 4, fever, pain in lower back and right leg and vomiting. On October 5, paralysis of right leg. Brother of the following case.

Case 76.

J. C., seven years, 29 Avery Lane, Great Barrington. Dr. M. T. Cavanaugh, Main Street, Great Barrington. On October 6, severe headache, vomiting and delirium at night. Fever, 103°. Some pain about the face and in the legs. On October 8, paralysis of right side of face.

Brother of the foregoing case.

Attended school at Dewey School, grade 2. Another brother attended same school, grade 6. This brother was regularly in school. The patient attended from the beginning of the term till the vacation for the fair, on September 24, with the exception of September 22. He was in school October 4 and 5, leaving on October 6. There are 11 other children in the family, 12 in all. In close contact with other Avery Lane cases.

Case 77.

M. O., two and a half years, 26 Avery Lane, Great Barrington. Dr. C. S. Chapin, Main Street, Great Barrington. Fever, some headache, delirium, beginning on October 7. Moderate retraction of head, and pain in right leg. Vomiting. On October 11, paralysis of right leg.

Sister attends Dewey School, grade 6. In contact with cases 73 to 76, inclusive, in same vicinity.

Case 78.

J. M., seven years, Austerlitz, N. Y. Dr. Bebee, Main Street, Great Barrington. This case and following are here included because they were seen by Dr. Bebee, and because of the resemblance of this case, in some particulars, to case 69. On September 28 returned from school, feeling miserable. On 29th was drowsy, and on the 30th still more so, becoming unconscious on the following day; and on this same day he became paralyzed in both arms and both legs. The unconsciousness continued almost without interruption till October 5.

He is a nephew of the domestic employed at the home of case 64 (Sept. 19) in Great Barrington, but there was no visiting between the two places for a considerable time prior to the time case 64 became ill. Letters were received from the domestic telling of the case in her employer's family. Neither did the aunt visit Austerlitz till considerably later.

There was a second case, an abortive one, in the family, as follows: —

Case 79.

D. M., five years, Austerlitz, N. Y. Dr. Bebee, Main Street, Great Barrington. Brother of the foregoing. September 29, 30, and October 1, acted queerly, complained of being dizzy and unable to walk. Three days later was quite well again, and had no further trouble.

In the western part of the town, without any known connection between them, through schools or otherwise, there were said to be 3 other cases, 2 of them in one family. This is a country town, with hardly a village or hamlet, the houses being considerably scattered.

Case 80.

G. D., twenty years, Sheffield, near Egremont line. Dr. A. T. Wakefield, Sheffield. About August 11, taken ill with fever, 100.5° to 102°, headache. Moderate retraction of head, pain and tenderness over lower dorsal and lumbar regions. On August 14, paralysis of both legs, and paresis of right arm.

No known contact with other cases. May have been in Great Barrington for a day previous to being ill, but at that time no cases in the town (Great Barrington). Lives on a farm, well isolated from any other case. Previous to his illness was an intimate associate with the following case.

Case 81.

F. L., twenty-one years, Egremont, near Sheffield line. Dr. A. T. Wakefield, Sheffield. Was an intimate friend of the preceding case (80), though the date of the last contact between the two cannot now be established. On August 20, sudden headache, repeated vomiting, and fever, never over 101°. There was retraction of head, and considerable pain in back and legs. On August 21, paralysis of both legs, together with some disturbance of the arms and back. Retention of urine after first twenty-four hours. The paralysis increased, and on the morning of August 23 he died from paralysis of respiration.

METHODS OF TREATMENT IN INFANTILE PARALYSIS.[1]

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[Summarized by the Department of Orthopedic Surgery of the Harvard Medical School.]

The purpose of this paper is to furnish to the practitioner, as far as is possible, a summarized guide in the treatment of poliomyelitis in its various stages of development.

Especial attention has been recently called to the importance of this disease, but as the symptoms vary considerably in the course of the affection it is difficult to refer to a succinct statement, giving in brief the treatment needed in the different stages, which at present are under investigation by several special departments of medical study.

Infantile paralysis may be divided into well-marked and characteristic periods, requiring different methods of treatment, as follows: —

Stage of invasion; stage of recovery; stage of permanent paralysis and disability; stage of progressing deformity; stage of developed contraction and deformity.

The practitioner needs to be able to recognize the different stages of the affection, the prognosis with and without treatment, and the measures to be employed at each period.

[1] Reprinted from the "Boston Medical and Surgical Journal," June 30, 1910.

History.

The affection described in this instance as infantile paralysis was first recognized and attributed to its proper cause by Heine in 1840, although mentioned by Underwood in 1784. A notable contribution was later made by Medin, who, in the Swedish epidemic of 1899, was able to study the acute stage. On the ground that two of these are the great contributors to our knowledge of the disease, Wickman advocates calling the disease the Heine-Medin disease. The name "anterior poliomyelitis" is pathologically less correct than the term "polio-myelo-encephalitis." The term "infantile paralysis" will be used here, as being, on the whole, the most familiar and the most simple. The objection to its use is that it implies that the disease affects only children, whereas adults are frequently affected in some epidemics. The name "infantile spinal paralysis" is advocated as being more exact than the term "infantile paralysis." The recognition of epidemics of infantile paralysis is of comparatively recent date. In 1841 Colmer, an American physician, described very briefly what was apparently an epidemic of 8 or 10 cases occurring in Louisiana, although he knew the facts only by hearsay and the authenticity of this epidemic is frequently denied. Bull, a Norwegian physician, in 1868 described, under the title of "meningitis spinalis acuta," an epidemic of 14 cases of what appears to have been anterior poliomyelitis. But Bergenholz, a Swede, writing in 1881, is generally credited with having been the first to recognize and describe such an epidemic with sufficient accuracy to make it acceptable. Since that time epidemics have been reported with increasing frequency. Our knowledge of the disease has been greatly increased in the last five years, the most important contributions being the monograph of Wickman, published in 1908, dealing with clinical phenomena on a new and much more extended basis than ever before. The pathological phenomena have been greatly cleared up by the work of Harbitz and Scheele, and the infectious nature of the disease proved by the work of Flexner and Lewis.

Frequency.

There is a general impression that anterior poliomyelitis is becoming more frequent and has increased in various parts of the world in the last few years. But such a conclusion must be accepted with caution, because of the fact that of late it has been called to the attention of the profession and is much more frequently recognized than it was formerly. An illustration of this possible source of error is furnished by the increased number of cases of congenital dislocation of the hip brought to American surgical clinics after the visit of Professor Lorenz and

the attendant newspaper notoriety. For at least a year following this the number of cases of this deformity brought to the Boston Children's Hospital was such that had the affection been one open to such a suspicion, the conclusion might have been formed that an epidemic of such cases existed in New England.

Bearing this factor in mind, from a study of the literature the following conclusions with regard to the increasing frequency of infantile paralysis seem justified: —

1. That epidemics of infantile paralysis have very greatly increased in several parts of the world in the last five years in a measure not to be explained in any way by the increased interest in the disease.

2. That it is more prevalent in cold than in warm countries.

3. That the northern part of the United States has suffered more than any part of the world.

The study of the epidemics, reaching over a period of thirty years, has led, of course, to the knowledge of certain facts now embodied in our stock of knowledge with regard to the disease, but they have not given us the essential facts that we want to know; we do not know how the disease enters the body nor how to prevent or check its spread.

It has been thought that the disease occurred most in dry seasons, and that dust must be taken into account; playing in fresh earth has been noted in children affected in some localities; the food supply, fruit, milk and water, insects, vermin and wounds must all be regarded as possible sources of infection. Now that the infectious nature of the disease is established, our line of inquiry is narrowed and made more definite. We must find out how the organism enters the body.

Communicability.

Wickman's conclusion is that practically every case has had contact with another (*a*) direct, (*b*) by healthy person, (*c*) by means of house. The following table shows the frequency of more than one case in a family: —

627 houses, ...	1 case.
95 houses, ...	2 cases.
39 houses, ...	3 cases.
14 houses, ...	4 cases.
7 houses, ...	5 cases.
1 house, ...	6 cases,

Bearing on the question of transmissibility, there are constant instances such as the following: —

From a German village where there had been no case for ten years, the wife of a railroad official took two children to visit in a village where

the disease existed. Five days after their return both children developed infantile paralysis and one died.

In a small German city there had been no case for many years. Two healthy women came from an infected village to visit. Eight days later a child of the house where they were staying developed infantile paralysis. The healthy children of this house visited the school where the teacher's children lived. In a few days the teacher's child sickened with infantile paralysis.

On the other hand, the disease is evidently not very transmissible. In the epidemic in the Deerfield valley, so carefully studied by Emerson, there were 67 cases. There were 166 other children in the families of those affected, and 86 other children known to be in intimate contact with the 67. Of the 253, 4 later developed the disease.

Disease in Animals.

Although a disease has been produced in animals which closely resembles infantile paralysis by various experimental methods, these need only to be mentioned, since infantile paralysis has been proved to be infectious and transmissible by inoculation. Experimental paralysis has been produced (*a*) by the injection into the lumbar arteries of dogs of finely divided powders; (*b*) by poisoning with the heavy metals (lead, etc); (*c*) by inoculation with various bacteria (colon bacillus, streptococcus, staphylococcus, etc.); (*d*) by the use of toxins; (*e*) in young laboratory animals it may occur spontaneously.

In connection with epidemics of paralysis in human beings, disease and paralysis among the domestic animals of the vicinity have been frequently reported, but in the absence of definite data it is as yet impossible to state that the animal paralysis is of the same character as the human infantile paralysis.

Infectious Character.

Infantile paralysis is an infectious disease and can be transmitted to monkeys by inoculation with the emulsion of cord and brain tissue from human beings and from monkeys dying with the disease.

Landsteiner and Popper produced the disease in two monkeys by intraperitoneal inoculation in 1908, but could not transmit it by subinoculation to a second series.

Flexner and Lewis [1] produced the disease in monkeys by intracerebral inoculation in October, 1909, and carried subinoculations through many series by the same and by other methods. Cultural and microscopic

[1] Journal American Medical Association, Nov. 13, 1909.

study was negative. This demonstrated that the disease was caused by a living organism, and established beyond question the infectious nature of the disease.

Römer,[1] Knöpfelmacher, Strauss and Huntoon,[2] Leiner and Wiesner, and Landsteiner and Levaditi [3] subsequently succeeded in causing the disease in monkeys.

The virus is contained in the brain and spinal cord, the mucous membrane of the nasopharynx in infected lymph nodes, in the salivary glands, and, in the acute stage, in the cerebro-spinal fluid and the blood.

The disease may be produced by intracerebral, intraperitoneal, subdural, intraneural, perineural and subcutaneous injections, and by implantation in the anterior chamber of the eye. The disease has been caused by the introduction of the virus into the stomach by means of a catheter, and into the intestines, the peristalsis being prevented by opium.

The disease has also been caused by scarifying the nasal mucous membrane and rubbing the virus into the injured membrane (Flexner and Lewis) and through the sound membrane by Leiner and Wiesner.[4]

The latter also succeeded in producing it by inhalation of an emulsion containing the virus, and by implantation in the trachea.

It would seem, therefore, as if the disease might, in human beings, enter through either the respiratory or digestive tract.

All investigators who have discussed the matter agree that the intracranial route is the best for inoculation, parallel experiments having shown the marked superiority of the former (Leiner and Wiesner).

Inoculations into horses, calves, goats, pigs, doves, sheep, rats, cats, rabbits, mice, chickens, guinea pigs and dogs have proved negative except for the results of Krause and Meineke,[5] who caused paralysis in rabbits by inoculation with similar material, but their results are not generally accepted by other observers as they are in contradiction to practically all other experimental work.

The virus is filterable, which places the disease in the category with foot and mouth disease, pleuropneumonia, yellow fever and other diseases less well known.

The virulence of an emulsion is not impaired by drying (seven days, Flexner) (nine days, L. and L.), by freezing, nor by suspension in glycerine, but it is injured by exposure to a temperature of 45° to 50° C. Emulsions of cord and brain from other diseases were inoculated into monkeys with no effect by Leiner and Wiesner (tuberculous meningitis, hydrocephalus, etc.).

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[1] Münch. Med. Wochenschr., Dec. 7, 1909.
[2] New York Medical Journal, Jan. 8, 1910.
[3] Compt. Rend. Soc. de Biol., Dec. 3 and 24, 1909.
[4] Wien. Med. Klin., 1909, xliv, 1671.
[5] Deutsch. Med. Wochenschr., Oct. 21, 1909.

That one attack of the disease confers immunity seems generally admitted. The serum of healthy monkeys does not immunize against an attack, but that of monkeys who have had the disease does antagonize the virus of subsequent inoculations (Römer and Joseph).

As to bacterial findings of previous authors, the latest investigations have been almost wholly negative, and, having found an invisible organism which causes the disease, the previous inconstant data with regard to bacteria may be disregarded for the present. Leiner and Wiesner withdrew fluid from the brain and cord in such conditions as tuberculous meningitis, hydrocephalus, etc., in three parts, and found in many cases that the first portion was contaminated by various cocci, while the second and third portions remained sterile, which suggests the ease by which contamination may occur.

Stage of Incubation.

The disease in monkeys possesses the same general characteristics as in children, and the pathological changes are practically identical. The monkeys seem to have less fever than children, but the mortality is higher. The stage of incubation is from six to upwards of thirty days.

The period of incubation in human beings is not clearly known, but is generally stated as being from one to fourteen days.

Symptoms.

The occurrence and symptoms can only be mentioned here in the briefest possible way.

The disease ordinarily has an acute febrile onset, frequently with sore throat or digestive disturbance, and in this stage the diagnosis is rarely made. Again, occasionally the onset may be absent. Tenderness is a frequent and highly important symptom, and profuse sweating has lately been called to our attention as a prominent early symptom. Paralysis is generally noticed in from one to seven days after the acute attack, but may occur almost at once.

Suspicious early symptoms are profuse sweating, hyperesthesia of the body and pain in moving, especially in the neck and back.

Wickman has divided the disease into eight types, a matter which is of much value in formulating and recognizing the disease. These are: —

1. *Spinal Poliomyetic Form.* — This is the recognized type described in the text-books, where a sudden febrile onset is followed by a paralysis of one or more limbs.

2. *The Ascending Form.* — In this type the paralysis ascends perhaps

to the thorax, often causing death by involvement of respiration. This covers many cases at least of so-called Landry's paralysis, the true nature of which may be recognized in adults, while in children the course of the affection cannot so well be followed. Most fatal cases belong to this type.

3. *The Bulbar or Pontine Form.* — Here there is involvement of the cranial nerves, most often the facial, hypoglossal and ocular, and there may be involvement of the throat and larynx. This type may exist alone or in connection with paralysis of the extremities.

4. *The Cerebral or Encephalitic Form.* — Although Wickman saw no case of this type personally in the large Swedish epidemic investigated by him, he heard of cases and collected others where a hemiplegia or spastic paralysis arose under circumstances suggesting that the cerebral lesion was really infantile paralysis. He concludes that the cerebral form may exist alone or in connection with spinal involvement, but this type cannot be regarded as satisfactorily established.

5. *The Ataxic Form.* — A disturbance of motion, not necessarily a pure ataxia, much like Friedrich's ataxia, may result from infantile paralysis. The seat of this ataxia may be in a lesion of the cerebellum, the middle brain or the bulbar portion, or it may be spinal.

6. *The Polyneuritic Form.* — This is characterized by points of pain and tenderness, and the diagnosis is frequently difficult from polyneuritis. The diagnosis of this form is not very clearly given, but the type is established by autopsy findings.

7. *Meningitic Form.* — Pain and stiffness in the neck, perhaps opisthotonos and meningeal symptoms, characterize this form. It is frequently confused with cerebro-spinal meningitis, which Wickman believes, after a long consideration of the evidence, to be a separate form of the disease.

8. *Abortive Form.* — In localities where infantile paralysis prevails occur many cases, often in the same families, where fever, headache, stiffness of the neck and general disturbance are present, but where the paralysis is slight and transitory or does not occur at all.

This form is of great importance as forming a probable link in the transmission of the affection. From the study of 157 abortive cases Wickman divides them as follows: —

(1) General infection.
(2) Symptoms of meningeal irritation.
(3) Cases with much pain, like influenza.
(4) Cases with marked digestive disturbance.

Diagnosis.

The diagnosis of the affection is rarely made before the paralysis occurs, nor is the possibility of the presence of the disease so often remembered as would seem advisable.

The diagnosis in the earliest stage must now be made by exclusion, for we have no positive signs at present, although recent laboratory data offer the hope that by means of examination of the blood and cerebro-spinal fluid a diagnosis may be possible in the stage preceding the paralysis.

The spinal fluid contains no organisms as yet recognized by the best observers, and those who find organisms do not find the same one.

The withdrawal of spinal fluid may be of diagnostic service, however. It may show the presence of tuberculous or cerebro-spinal meningitis, the diagnosis of which from infantile paralysis is not always easy. Certain important points may be mentioned as bearing on the diagnosis. The disease occurs oftenest in the late summer; it is epidemic in many localities; it affects most often children in the first dentition; the onset is a febrile attack, with most often excess of pain, sweating and often drowsiness. The throat or intestinal tract are frequently involved. Meningeal symptoms in any degree are very suspicious. Tenderness of the spine, body or limbs should awaken suspicions at once.

If these facts are borne in mind, many more early diagnoses can be made. There is no criterion for the diagnosis of abortive cases, nor can the diagnosis in any case as yet surely be made in the absence of paralysis.

In many instances the prodromal stage of general indisposition is slight and the affection is treated by cathartics or a febrifuge or disregarded. In some instances severe pain referred to certain regions is observed, and the affection is regarded as rheumatism, peritonitis, pleurisy, etc., and if cerebral symptoms are present, cerebro-spinal meningitis is suspected.

Where motor paralysis is present, the sudden onset, the absence of reflexes, the progress of muscular flaccidity, surface coldness, the absence of sensory paralyses, with or without a short period of pain, followed by muscular atrophy, combine to form a characteristic group of symptoms, making the diagnosis an easy one.

In the later stages of infantile paralysis, when contractions and deformity are present, there is, as a rule, no difficulty in recognizing the disease, as the history of the case, the flaccidity and atrophy of certain muscles, with the presence of normal sensations, are sufficient to establish the diagnosis.

Cases of hysterical paralysis may simulate poliomyelitis, but the symptoms in purely functional cases do not group themselves usually in a manner typical of infantile paralysis.

Prognosis in Untreated Cases.

It is extremely difficult for a physician in examining a case in the early stages of its development to estimate the outcome of the attack. As a rule, the painful stage is brief, lasting but a few days, and at most not longer than a few weeks. Spontaneous recovery of great improvement can be expected in all but the fatal cases. The recovery is gradual, and may be expected to continue during six months or a year after the attack of the paralysis. Even later the improvement in the functional activity of the affected limb may occur following the use of the affected limb.

An exact determination of the extent of the paralysis by examining the electrical reaction is difficult in young children, and, for this reason, often impracticable. The surface temperature, that is, coldness of the limb or region, to the touch, offers a ready means of estimating the extent of the region involved.

Treatment.

The consideration of the treatment of anterior poliomyelitis may be divided into that of the affection during three stages; *i.e.,* (1) the early stage of acute onset and fever; (2) the subacute stage; and (3) the stage of established paralysis and convalescence.

Treatment of the First Stage.

The early stage of acute onset and fever extends from the first appearance of the symptoms indicating the infection until the entire subsidence of the fever and acute pain. The duration of this stage necessarily varies. The symptoms demanding attention in this period are the preliminary chill, fever (with or without delirium), pain and marked sensitiveness.

These suggest at the onset the general treatment used in all febrile attacks, — mild cathartics if digestive disturbances are present, and rest.

1. *Rest.* — The question of rest is one which largely settles itself, since the acuteness of the symptoms demands the utmost quiet. In the early stage there is fever, possibly delirium, and marked depression, all of which are found in varying degrees of intensity. Attending these is marked sensitiveness to all motion, which demands that the patient be kept in the utmost quiet. When sensitiveness is not prominent, and does not of itself demand quiet, it is wise to enforce this during the early stage.

2. *Drugs.* — The drugs to be considered in this early stage are: (*a*) antipyretics; (*b*) sedatives and analgesics; (*c*) internal antiseptics; (*d*) nerve stimulants; (*e*) external applications.

(*a*) The use of antipyretics, except as perhaps temporary expedients with very high and early temperature, is not advisable, owing to their depressing action.

(*b*) Sedatives and analgesics, and drugs of this class, may be distinctly indicated in the early stages in more severe cases, especially those presenting delirium or excessive spinal and occipital pain. Owing to the rather depressing effect of sedatives, it is wiser to use analgesics, either codeia or morphia, if they are distinctly necessary, but it is well to enforce the necessity of the avoidance of all drugs of this kind whenever possible.

(*c*) Internal antiseptics. The use of the internal antiseptics in this class of cases must be at present considered to be in the trial stage. It is well proven that drugs such as urotropin, cystogen, aminoform, formin, etc., are internal antiseptics, and that their action is demonstrable in the excreta, in the blood and in some of the tissues. Their usefulness has been proven in some cases of infection. Their trial, therefore, is to be advocated as early as it may be possible to feel confident of the probable diagnosis.

(*d*) Nerve stimulants. Nerve stimulants, chief among these being strychnia, should be avoided during this acute stage.

(*e*) External applications, such as physical therapeutics and hydrotherapeutics, are of doubtful usefulness in this early stage, and are liable to disturb the rest which is so strongly indicated at this time. The use of electricity in this stage is to be carefully avoided.

3. *Lumbar Puncture* is not advisable either for diagnostic or therapeutic purposes with our present knowledge, although it is not improbable that in the future the method may have its use.

The Treatment of the Second Stage.

The second stage may be considered as extending from the end of the first period of onset to the time of the disappearance of all sensitiveness, fever and nerve tenderness. This stage will vary much in duration, and usually does not extend over a period of more than three to four weeks, or less, but is occasionally prolonged to five or six weeks. In this stage the fever and early pain have entirely subsided, but there is frequently left sensitiveness along the nerve trunks, pain, motion of the limbs and sometimes of the back. There may also be found contraction of the limbs, mainly of the hips and knees, due to the persistence of sensitiveness, which does not allow the limbs to be brought into the

straight and normal positions. The patient should be kept from unnecessary movement and should be moved on pillows or bed frames when practicable. There is often more or less exhaustion following the early fever and infection, and in such cases stimulation of the general condition is indicated.

It is important in this stage to prevent the overstretching of paralyzed muscles, either from pressure of bed clothes, position of decubitus or force of gravity, or the unantagonized pull of the sound muscles. Deformities of position may be developed even in this stage, and, although not necessarily permanent, add much to the discomfort in the later correction. These are to be guarded against and prevented unless the appropriate measure gives actual pain. Splints or a weight pull are rarely necessary for retention in this early period, but the position can be arranged by pillows, sandbags, cradles for the bedclothes, etc., to prevent the development of such. In many cases, however, the deformities due to pain on moving limbs disappear on the subsidence of the pain. The application of heat, either a warm, moist or dry pack, or the electric pad, will often be found to relieve pain. Gentle massage is often difficult on account of the presence of pain, but may give relief if carefully applied.

Drugs are to be used with much discretion in this stage.

The Treatment of the Third or Convalescent Stage.

This stage can be considered to extend from the period of the entire disappearance of the sensitiveness and the contractions of the early irritant stages until the time that all potential power has been regained, or until the deformities require no further attention. The time in which it is possible for further increase of muscle power to be regained varies very decidely with different cases, but the time during which deformity requires attention cannot be considered to end until the full growth of the individual has been attained. Two special demands are important throughout this stage, and although intimately related are more practically considered independently, both in their description and clinical manifestations. These two are: —

1. The prevention of deformity.
2. The regaining of nerve and muscle power.

1. *Prevention of Deformity.* — Deformities which occur in the course of recovery from infantile paralysis are those of the limbs and those of the spine, a form of scoliosis. Deformities of the limbs from adaptive tissue changes are due either to the constant contraction of the unantagonized sound muscles, or else from faulty position, the paralyzed limb hanging unnaturally or bearing weight wrongly. From the maintenance of these

positions contractions occur which make permanent the deformities, and if these are allowed to continue during the child's growth, distortions in the shape of the bones occur as well as in the soft parts, which render the deformities still more permanent. It is especially needful that apparatus be employed in this stage for a twofold object, *i.e.*, first, to prevent the overstretching of the paralyzed muscles during the early stages; and, second, to prevent the permanency of the deformities mentioned.

The need of the early detection of a faulty position of the spine and of early care in the prevention of scoliosis cannot be too strongly stated. On account of the general muscular weakness and of the unequal pull of the trunk muscles, the asymmetrical methods of walking and standing and the faulty superimposed weight, or the one-sided use of the arms in cases of paralysis of the upper extremity, all motions on the part of the patient tend to exaggerate the development of deformity when once under way. For this reason this form of scoliosis presents a most obstinate type for treatment, and as soon as there is any evidence of a beginning deformity of the spine every effort should be directed to check its development.

2. *The Regaining of Nerve and Muscle Power.* — It is unfortunately a prevalent idea that recovered power is gained within the first few months of the convalescence, and that after this the child should not be burdened with special efforts directed toward developing individual muscles and nerves, the natural use of the regained muscles being sufficient to establish all the cure which is possible. This idea is particularly unfortunate, for the clinical facts prove the contrary. It is possible to gain a return of muscle power after a long period following the onset of disease, even when during the interval there has been no evidence of actual local return of power. It is very essential, therefore, that treatment directed to this end be carried out, not only in a most thorough manner, but also over an extended period. The indications during the early convalescent stage are two, viz., for: —

(1) The stimulation of the nerves to prevent all possible degeneration until all possible repair has taken place; and

(2) Stimulation and protection of muscles to prevent atrophy and to keep the muscle in condition, that it may respond quickly when nerve impulses are restored. Incidental to this the all-important reason that it is essential that muscles be not allowed to be overstretched, but the parts be so held as to prevent deformity. This is easy and demands the application of the lightest form of braces or apparatus for this purpose, and not only prevents the overstretching of muscles, which is so essential, but also prevents the correction of unnecessary deformity in the later stages.

For stimulation of nerves and muscles the means to be employed are: —

1. Electricity.
2. Baking and different forms of high heat.
3. Physical therapy (including mechanotherapy, hydrotherapy and massage).
4. Muscle training.

The first three of these must be considered as means of artificially stimulating the parts by maintaining nutrition, with the exception, possibly, of the electricity. It is wise to have the different methods well in hand, because we have reason to believe that the effect of the different methods of artificial stimulation are not exactly the same, and it gives the opportunity of change from one form to another at different periods, both with the idea of rest to the patients and to obtain the different forms of stimulation as well. The lack of use, with its attendant sluggish circulation, if not counteracted, is a distinct obstacle to the proper nourishment of the part, and it is, therefore, necessary to use all methods which are possible to maintain this to the highest standard that is possible.

1. *Electricity.* — The different forms which may be used for this are the galvanic, faradic, static and high-frequency currents. In the early stages galvanism should be used on the nerve trunks and faradism on the muscles, so long as their irritability for contraction is maintained. When the irritability of contraction to the faradic is lost, galvanism should then be used, as having more influence on nutrition. With the returning muscle irritability, faradism should be used, and best by the use of the electrodes over the muscle points so as to obtain actual contraction of muscles rather than by the application of the electrical current to broad surfaces. This serves as a distinct exercise to the muscle during its early stage of weak contraction. High-frequency and static electricity can both be used for their influence on nutrition rather than for their direct action on muscle contraction. It may be stated in this connection that the main dependence for actual results must be placed upon the galvanic and faradic currents.

2. *Baking and the Other Means of applying High Degrees of Heat.* — Paralyzed limbs in these cases are almost always cold and the circulation distinctly defective. It is found after the use of baking and different methods of applying high degrees of heat that the extremities remain warm for a longer time; that the circulation is more active; the blush and the temperature remain higher for some time; and the patient is able to use the very weak muscles much better, and with better control, during the time that the limbs remain warm. It is frequently found that after continued use of high degrees of heat this improvement of circu-

lation and the local heat of the limb become more and more permanent, frequently lasting for the larger part of the day or longer. It is essential that the baking should not be used in too high degrees (probably not more than 250°) and not continued for too long a time (fifteen to twenty minutes), the shorter application being quite sufficient to bring out the changes of circulation desired.

3. *Physical Therapy* (*including Mechanotherapy, Massage, etc.*). — These constitute another means of artificial stimulation, both of nerve and muscle, particularly in their effect upon the circulatory changes. The physicotherapeutic methods are less generally applicable, demanding apparatus for their use, but massage, however, should be given the highest place in all stages of this affection. In conjunction with massage, however, it is wise to reiterate the caution that it is necessary not to rely upon massage alone, but that this means should be regarded as an adjunct only to the other forms of muscle and nerve stimulation. Too frequently has it been remarked that massage alone is used to the neglect of many of the other means fully as important.

4. *Muscle Training.* — Probably no other means at our disposal has a more important place or more extended usefulness, both in the variety of its application and in the length of time that it may be used, than the different methods which may be grouped under this head. It is applicable as soon as any sign of returning power is found, and is best applied through the "assistive form" of exercise, which has the advantage of allowing actual work to the muscle long before power is sufficient to give any practical result in movement. The difficulty with the usual forms of gymnastic exercise in these cases is that the stronger muscles receive the greater part of the exercise, while the weaker and most needy muscles receive but little. Most cases present so many individual needs that it is necessary to concentrate the work, and for this reason it is essential that the weaker muscles obtain all possible results from the means employed. Such is not possible when the patient is given the ordinary gymnastic exercise, relying upon the stronger muscles to bring about the movement and giving the weaker muscles the opportunity to participate in the movement. This method is applied in detail as follows: —

The part to which the muscle belongs is put through passive movement, with slow rhythm, in the direction that is desired. The patient is then directed to make effort to move the part in the same direction to whatever extent is possible, the assistant supplying the power needed to complete the actual motion. In this way the paralyzed muscle is allowed to contract in the same manner as if it were doing the whole of the work, and has the benefit of the contraction and of the movement during the whole arc of motion. As the muscle becomes stronger, the assistive force

supplied becomes less, so that the muscle is allowed to take up more of the work during the whole of the exercise, and receives the maximum amount of exercise possible to a muscle in its condition. In all the other forms of exercise one must be contented with the mere effort of the muscle to make contraction, without allowing contraction through a distinct arc of motion.

In the treatment of cases of infantile paralysis at this stage it is difficult to apply the needed remedies for a sufficiently long period to accomplish the good which can be obtained. Patients remote from physicians' offices or hospitals equipped for special treatment cannot receive it satisfactorily. In most instances home nursing must be relied upon, and electricity crudely or infrequently applied is of no benefit. Under such circumstances the physician should direct his attention to enforcing, for a long period, such measures as can be used effectively, viz., hot-air, hot-water or hot-sand baths of the paralyzed limbs at frequent intervals, and passive and active movements of the limbs, improvement of the circulation by muscle kneading, and especially muscle training, continued daily for a long period. The aid of an expert is undoubtedly advisable, but the constant daily faithful work of home attendants is more beneficial than occasional treatment at infrequent intervals.

Nerve Grafting.

The success which has been obtained in a few instances of nerve grafting has been such as to encourage the belief that great relief could be furnished in confirmed paralysis from anterior poliomyelitis by this surgical procedure, but clinical evidence so far collected does not substantiate such an opinion. The method may be regarded as still in the experimental stage, and at present it does offer much hope of relief, and the number of cases to which it is applicable is small.

Mechanical Treatment.

The objects of mechanical treatment for infantile paralysis are: —

1. To correct the deformities of the limb.
2. To prevent the development of new deformities.
3. To aid locomotion by furnishing, through the mechanical stops and checks, a substitute for the action of muscles weakened or paralyzed by the disease.

The number of types of appliances which can be derived is great. Those which are simple, light, easily designed and easily applied are to be preferred. Expensive, heavy and complicated forms of apparatus are undesirable.

Those which have been for many years used at the Boston Children's Hospital will be referred to in this report because, in design and construction, they are suited to the practice of any general practitioner who is ready to give personal attention to making, fitting and adjusting an appliance to prevent the development of deformity in his patient.

Early Stage of Paralysis.

Appliances for this stage should interfere with the circulation as little as possible, since it is desirable to develop the impaired nutrition and circulation, not to impede it. For this reason plaster bandages and splints tightly secured by a muslin bandage are less used than formerly.

Toe-drop can easily be prevented while the child is in bed by fixing the limb on a simple posterior wire splint such as one uses for fractures (Fig. 1).

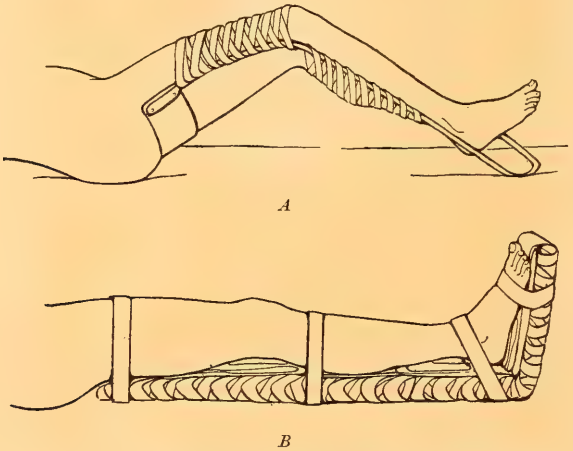


FIG. 1.—*A*. Wire splint for straightening contracted knee. *B*. For preventing drawing up of the knees and dropping the front of the foot.

Iron wire three-sixteenths of an inch in diameter is stiff enough; this is bent to the proper shape, thickly wound with cotton wadding, firmly covered with a roller bandage, and a cover of stout cotton cloth is sewed over it all. Sufficient padding is provided under the calf and under the sole of the foot to entirely remove pressure on the back of the heel; the leg and foot are fastened to the splint by adhesive plaster straps, applied so as to keep the axis of the foot at a right angle with the leg.

If this splint be prolonged to reach the upper part of the thigh, and is made stiff enough, contraction of the knee can also be prevented. A roller bandage should only be used to make the adhesive plaster stick.

While this is sufficient during the stage when the patient is unable to stand, a stronger appliance is needed when he begins to walk.

Splints for Walking.

These splints are designed for two classes of cases, — those in which a flaccid paralysis is present in some of the muscles, and those where, in addition to the paralysis, a contraction and shortening has taken place in muscles which are not paralyzed but have lost their antagonists.

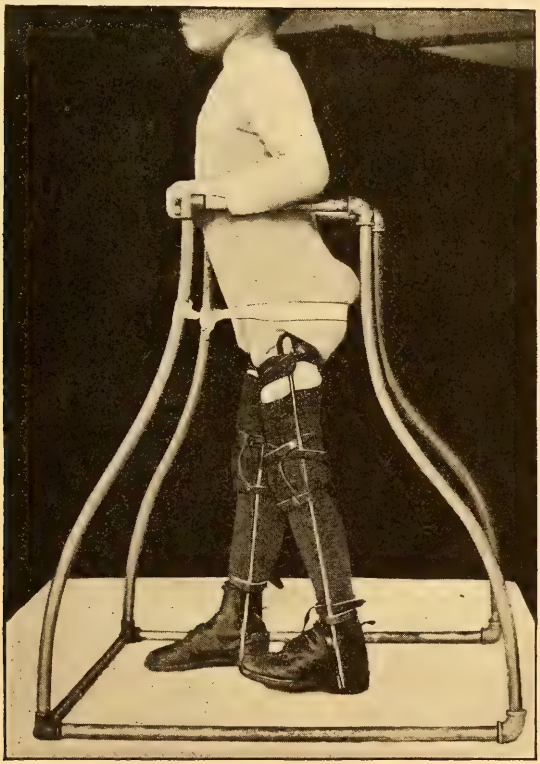


FIG. 2. — Paralyzed child strapped in a walking frame wearing splints to prevent forward dropping of the knee.

In the first class no stiffness or contraction is present, and splints may be needed to prevent (1) toe-drop; (2) dropping of the tarsus to the inner side; (3) dropping of the tarsus to the outer side; (4) walking on the heel, *i.e.*, the equinus, valgus, varus or calcaneus positions of the foot; and (5) to hold the knee straight in paralysis of the muscles of the front of the thigh.

For Flaccid Paralysis.

Where no stiffness from contraction is present, this simple apparatus can be furnished to prevent toe-drop (Fig. 5). It is called a short caliper splint. It consists of two parts, the splint and the socket attached to the boot.

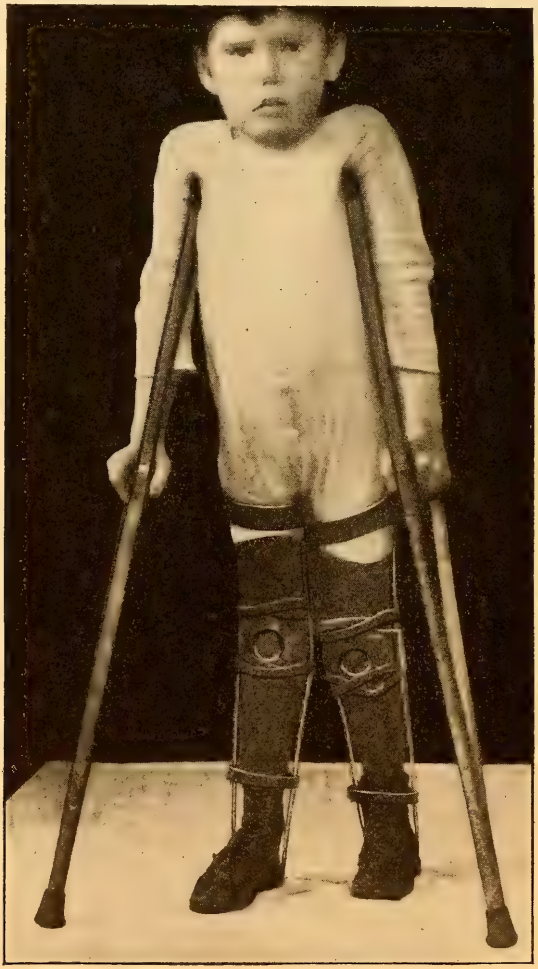


FIG. 3.—Child walking with crutches and splints.

The socket is made of a thin iron plate, made to fit under the heel and the shank of the child's boot, as far forward as the metatarso-phalangeal joint. The heel of the boot is first removed, and a deep

groove or socket is fashioned in the plate by forging, so that when it is applied to the boot it will receive at the heel the end of the upright, as if in a tube. A small spur piece, which is left projecting outside the boot, is bent up after it is applied, so as to act as a stop, as shown in the illustration (Fig. 8), and the boot heel is reapplied.

For the uprights the same sort of wire is used as for the posterior wire splint already described. At the top the wires are slightly flattened and attached to a thin metal calf-band fitted to the calf of the leg; at the bottom they are sharply bent inward at a right angle so as to fit in the socket. The uprights may follow the shape of the leg, or be left straight, provided they allow width enough so that the ankles do not touch them.

This simple splint can be easily improvised with the help of a cobbler and a blacksmith or carriagesmith at very slight expense. It is held in place by a strap at the top and one around the ankle.

Should the patient, instead of having toe-drop, have paralysis of the calf muscles, while the muscles of the front of the leg are strong, he will walk on his heel, with the front of the foot raised. In order to apply the sole of the boot to the ground, the same splint may be used to advantage if the socket be made so that the stop comes in front of the upright instead of behind it. This is shown in Fig. 4, on the left leg.

Should the child stand with the foot in the varus or club-foot position, a stout leather T strap should be added, which is sewed to the upper of the boot, just in front of the external malleolus; the horizontal arms buckle into each other and include the inner upright of the splint.

Should, on the other hand, a pronated or valgus position appear in weight bearing, the T strap should be on the opposite side of the boot below the inner malleolus, and the arms strapped around the outer upright so as to maintain the arch of the foot by preventing the ankle from sagging inward (Fig. 7). These appliances are for flaccid joints only.

Again, if, owing to paralysis of the muscles of the front of the thigh, the quadriceps extensor cruris, the child cannot hold the knee stiff in standing, then the caliper splint should be made to reach the upper third of the thigh and the knee be kept straight by a leather knee cap, as shown in Figs. 2, 3 and 4, which also show the method of teaching the child to walk stiff-kneed.

For Paralysis with Slight Contractions.

Any paralytic deformity in time develops contraction of the strong unaffected muscles. This is especially true if the calf muscles are not affected.

Equinus Deformity.

In slight degrees, contraction of the short tendo Achilles can be overcome by stretching the muscles with a special splint in walking, if the heel can be held down firmly against a foot plate which extends well forward, while toe-drop is prevented by a stop in the ankle-joint of the upright (Fig. 5). At times it is hard to accomplish this because the heel refuses to stay down on the sole-plate, but it may be held there either by a strong ankle strap or by a strip of adhesive plaster attached to the skin of the calf of the leg above and to the lower surface of the sole-plate below. Such an apparatus can be worn inside of the boot. The correcting force is the body weight. This may be increased if the appliance be made long enough to reach to the upper thigh and prevent bending the knee. It can be worn day and night, and additional corrective force may be added by an elastic strap extending from the front of the sole-plate to a buckle on the upright near the knee.

Varus with Slight Contraction.

In paralytic varus deformity a thick leather wedge is pegged to the lower surface of the sole of the boot under the cuboid, so that the foot in walking strikes first on the heel, then on the wedge which projects more than the heel, and forces the foot to turn outward to prevent loss of balance, so that the foot at the end of a step, before leaving the ground, receives the body weight wholly on the abducted front portion.

Valgus with Slight Contraction.

In paralytic valgus deformity, when the contraction of the peronei muscles is slight, the position of the walking foot as it bears on the ground can be improved by supporting the sagging arch, both by an upright and T strap (Fig. 7), and by pegging a thick wedge of leather on the lower surface of the sole of the boot, extending forward along the inner side from the heel to the scaphoid, or under the first metatarsal, as the case may require.

Calcaneus.

In cases with slight contraction the position of the walking foot, as it strikes the ground, can be improved by prolonging the heel backwards (Fig. 8).

Appliances to overcome Stronger Contractions.

The above-mentioned appliances are only for slight contractions; when firm contractures have developed, they are to be stretched or divided by an operation, under full anesthesia, either by manual force, tenotomy or

incision, as may be needed; but for a few mild cases the gradual corrections are sufficient which one obtains by plaster bandages or mechanical appliances.



FIG. 4.— Side view of "caliper" splint, with knee strap and checks in the heel to prevent the dropping of the heel or front of the foot as may be needed.

Plaster Bandages.

Gradual correction by the frequently repeated application of plaster bandages is obtained by holding the limb in as corrected a position as possible while the plaster sets, without the aid of an anesthetic. It is effective in recent contractures in young children. The method has to

its disadvantage that both muscular atrophy and weakening of undestroyed muscles are favored by the prolonged use of stiff bandages; therefore this method should not be continued during a long period.

The contractures which the surgeon has most frequently to overcome are those of the tendo Achilles, the ham-strings, the tensor vaginæ femoris and fascia adjacent, the psoas and iliacus muscles; also contractions of the tendons and fascia in the various paralytic deformities of the foot. These are caused partly by the shortening of unopposed muscles and partly by adaptive shortening or stretching of ligaments and fascia from habitually assumed positions of deformity, either on account of gravity or disturbed muscular balance.

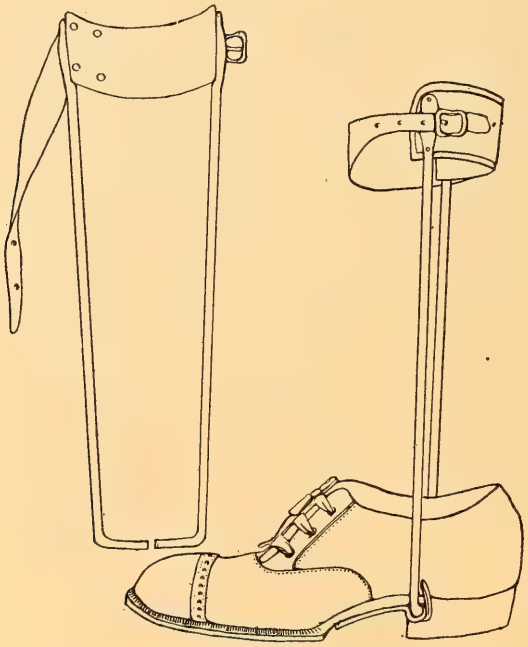


FIG. 5. — Detail of wire splint, showing adjustment to the shoe, with check to prevent toe-drop.

For the correction of contracted ankle, unless the equinus position yields readily to mechanical means, tenotomy of the tendo Achilles is decidedly preferable.

For a contracted or flexed knee, mechanical measures are better adapted. If the type be mild it can be overcome by the application of a splint resembling both Thomas' knee splint and his caliper splint, already described, to which the limb can be bandaged in the manner shown in Fig. 6. The corrective pressure is obtained largely from the bandage

over the thigh and knee, which should be applied at least twice a day. This apparatus can also be used to walk with. If any form of acquired club-foot is combined with the contracted knee, it may be corrected simultaneously in the manner already described.

For contractions of the hip-joint not severe enough to demand operation, two common methods of correction are in use.

1. By encasing in a plaster bandage the limb, with the knee straight, its weight may be utilized to stretch very gradually the contracted muscles and fasciæ of the hip; this may be done either while the child is walking about, or, preferably, while he is in bed, on a bed-frame. Sometimes a separate plaster jacket is required for these recumbent cases, to prevent lordosis of the lumbar spine.

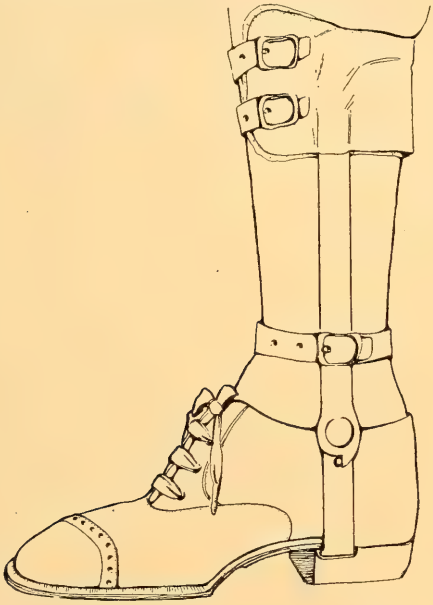


FIG. 6. — Apparatus to prevent toe-drop slipping in a socket at the heel. An ankle strap secures the leg.

2. A direct pull or traction may be used, such as one would use to correct flexion in hip disease. The patient is then kept on a bed-frame with the pelvis fixed by extreme flexion of the unaffected thigh, and the paralyzed leg is elevated, and traction is applied in such a position that the line of pull coincides with the new direction of the femur; traction is first made in this direction, and from this position the limb is straightened very gradually day by day.

All contractions at the hip may without doubt be overcome more

quickly by the use of the knife, with subsequent fixation, than by mechanical means, but an objection is often encountered in children with extensive paralysis because there remains in the limb so little muscle power that any loss, whether from tenotomy, myotomy or prolonged use of plaster bandages, is risky, as every particle of muscle power must be treasured and developed to enable the child to stand upon his feet when the deformity is sufficiently reduced.

Supports for the Trunk.

Plaster jackets may be applied in several different ways, and when properly applied are efficient supports to the paralyzed trunk. They may also be used to straighten the abnormal twists and curves of the spine which develop as the result of poliomyelitic paralysis, and are then termed "corrective jackets."



FIG. 7.—Apparatus similar to Fig. 6, with ankle strap to check paralytic valgus. If the upright is applied to the inside with the ankle strap applied to the outside a varus deformity is checked.

Plaster jackets may be made removable by splitting down the front and sewing to each side of the border a strip of leather, with eyelets or hooks for a lacing. They are more convenient for reasons of cleanliness, but soon lose their efficiency because they crack and weaken if frequently removed. More durable jackets are made of leather, celluloid or muslin-paper-and-glue molded on a cast made from a plaster jacket. For the details of manufacture the reader is referred to the text-books of orthopedic surgery.

Lateral curvatures from poliomyelitis sometimes require treatment by recumbency to obliterate or diminish the curves, but in most instances plaster corrective jackets are required for the severe types of curvature, and the subsequent use of stiff leather or celluloid corsets is often necessary for a long time to keep the curvature from increasing.

Apparatus to strengthen Weak Muscles.

Poliomyelitis may weaken certain muscles without paralyzing them; it is desirable to lessen the disability by developing their strength again, and, as far as possible, to secure a return of normal motions of the limb. This can usually be accomplished by systematic exercises carried out regularly once or twice a day.

Again, certain muscles may be weakened, not by the disease itself, but by disuse entailed by it, although not in themselves involved in the paralytic attack. For these also it is desirable to use a simple means of exercise.

Exercises can be made to vary almost indefinitely; but simple exercises, with manual resistance, or with the weight and pulley, have proved of great value. They can be arranged to suit the action and development of any group of muscles.

The stationary bicycle has also been an excellent means of exercising the feet and legs of weak-limbed children.

How to place a Long-paralyzed Child on its Feet.

If a child who has been long paralyzed begins to move the legs and ankles, but cannot yet stiffen the knee, a pair of simple caliper splints, like Figs. 3 and 4, should be fitted and applied. Then he is dressed, placed on a bed-frame which is raised at the head, so that he gets used gradually to a more and more inclined position, until one day he can lean in his frame almost straight against the wall, with the feet resting on the floor. When the child becomes afraid of falling sideways, crutches are given him; then he is taught for some days to kick the feet out, alternately resting on one or the other foot. When he has acquired sufficient confidence and control of these motions, the frame is tipped forward, he leans upon his crutches and tries his first steps, still with the bed-frame strapped to his back and steadying him. This must be accomplished very slowly if the child has long been bedridden.

Another device which has proved of great use is the modified baby-jumper, shown in the illustration (Fig. 2). Fig. 3 shows the same child, who has discarded this apparatus for crutches; and Fig. 4 shows him walking without crutches.

Operative Measures.

In the later stages of infantile paralysis surgical measures may be necessary; first, to overcome contractions which have developed; second, to improve the functional usefulness of the paralyzed limb after mechanical apparatus and prosthetic appliances have failed to accomplish all

that can be desired. In many instances contractions can be better overcome by means of operative intervention than by apparatus, and the appliances needed for locomotion will not be needed after successful arthrodesis, or muscle transference.

It is not within the scope of this paper to give the details of the surgical procedures which may be of use; but it is desirable that every practitioner should be informed of such measures as are frequently employed in alleviating the disability resulting from anterior poliomyelitis.

Operative Measures to correct Deformity.

1. *To overcome Contractions.* — In overcoming contractions, the contracted soft parts need to be divided, either by an open incision, in the more resistant cases, or by tenotomy. Open incision is usually the better procedure in contractions of the hip and in the more resistant, old deformities at the knee, but in distortions of the foot, knee and hip in young children, tenotomy followed by forcible correction will be sufficient. The contracted limb, after operative correction, can be placed for a short time in a plaster bandage, to be followed by a suitable apparatus.

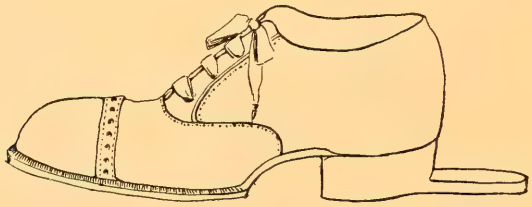


FIG. 8. — Heel extension to be used to check calcaneus deformity.

Osteotomy. — Division of the bone is rarely necessary in the deformities following infantile paralysis. In the extreme cases, however, a linear osteotomy of the lower end of the femur is sometimes needed; in older patients, a wedge-shaped excision of the bone may, in addition to tenotomies and open incisions, be necessary to correct the more extreme deformities of the knee and foot.

2. *Operative Measures to aid Functional Activity.* — Poliomyelitis injures the usefulness of the limb either by impairing the strength of some of the muscles, completely paralyzing others, or by a total destruction of the functional power of all the muscles of the limb. The needed operative measures are of two kinds: —

(1) Those designed to stiffen flail or loose joints so that the joint may be made capable of bearing weight; or

(2) Measures which will give voluntary motion in the directions where power has been lost by paralysis.

(1) *Joint Stiffening.* — If weight is thrown upon a paralyzed lower extremity the knee bends forward and the patient falls. It is evident that if the knee-joint is stiffened in such a way that it cannot bend, the bones will be capable of sustaining the superimposed weight. This can be made possible at the hip, ankle and mid-tarsal joints. The operation of joint stiffening or arthrodesis is, therefore, one which has received much attention from surgeons. The cartilaginous surfaces of the two adjacent bones are removed in the expectation that the bared bone surfaces will unite, forming an ankylosis, and a stiff joint result. Practical experience has shown that this method is not applicable to young children, and should not be undertaken in children under ten, particularly arthrodesis of the knee and foot.

In young children the ends of the bones are largely cartilaginous, and the amount which it is necessary to remove to obtain an ankylosis is considerable, and mutilation necessarily results, sometimes to an undesirable degree.

In addition to this, in children, when a growth of the limb takes place, the limb may grow in a direction of distortion, and the ultimate condition may be worse than if no operation had been attempted, the patient wearing a suitable correcting apparatus.

The operation of arthrodesis is one which can be applied to the shoulder-joint and to the hip-joint. In the shoulder-joint the arm should be after operation, during the period of healing, placed in a position somewhat abducted from the body. Arthrodesis of the hip-joint is less frequently needed, but has been found beneficial in some instances. Arthrodesis at the knee-joint leaves the patient with an awkward limb, which for practical purposes is not as serviceable as one supplied with a suitable prosthetic appliance. In certain instances, however, where it is difficult to furnish a proper apparatus, patients often prefer the inconvenience of a stiff knee to the constant use of an appliance.

In deformities of the foot, where no muscular strength remains and the patients are not young, an arthrodesis between the astragalus and tibia, the os calcis and astragalus, and the midtarsal articulations (the astragalo-scaphoid and calcaneocuboid) is often of benefit.

Successful attempts have been made to substitute for the complete stiffening of the joints by erasion of the cartilaginous surfaces a stiffening of the joints by periosteal flaps. This has been performed chiefly at the ankle-joint, where a periosteal flap from the lower end of the tibia has been freed and attached to the astragalus and scaphoid. This involves less mutilation than cartilage erasion, and is more suitable for young children.

Silk Ligaments.

Partial stiffening of the joint by means of the insertion of silk strands, properly sterilized, quilted in the periosteum of the bones adjacent to the affected joint, has been successfully performed preventing toe-drop and checking the slighter forms of valgus and varus in children and adolescents. The method is one which requires technical skill and experience.

It has been found that these silk ligaments, properly inserted, remain in the tissues and become in time surrounded by fibrous tissue, which serve the purpose of checks, capable of permanently preventing the development of severe deformity.

Whitman's Operation.

In cases of calcaneus deformity, that is, the paralytic deformity where the weight is borne on the end of the os calcis, the front of the foot not being able to strike the ground, owing to the weakness of the gastrocnemius muscles, a serviceable operation has been devised by Whitman, consisting of the ablation of the astragalus and the slipping of the foot backward, so that the weight is borne upon the middle of the foot instead of its posterior third. A useful foot results, the ultimate functional result being excellent.

Fixation by Skin Scar Contraction.

This method has been employed by Jones of Liverpool in flail elbow, and is one of ready accomplishment. A flap of the skin is dissected at the bend of the elbow and sutured into the lower portion of the upper arm. On healing, the arm will be held bent, and will become more useful than a loose elbow.

Muscle and Tendon Transference.

Where certain groups of muscles are paralyzed and the opponents remain strong, a transference of one or more of the strong muscles to perform the function of the weak muscles has been proved to be of benefit. Tendon grafting, that is, the insertion of the tendon of a strong muscle into the tendon of a weak muscle, although temporarily a help, has not, as a rule, been found to be as permanently beneficial as the transference of muscle or tendon with the periosteal insertion of the transferred tendon on a point of bone where a strong attachment can be secured to the periosteum. This gives a proper point for the contraction of the transferred muscle to perform the function lost by the

paralytic attack. Where the transferred muscle or tendon is not sufficiently long to furnish a periosteal insertion, the tendon can be elongated by means of silk strands properly prepared. This measure is especially suitable in paralytic affections of the foot, of the knee and of the shoulder-joint; it has also been used for paralyzed muscles about the hip. It is manifest that, in the successful performance of this operation, strictly aseptic precautions are necessary. The silk strands should be not only thoroughly sterilized, but it has been found advisable, as pointed out by Lange, who introduced the method, that the silk strands should be boiled in a solution of 1–1000 of corrosive sublimate, subsequently boiled in a solution of paraffin, in order to prevent the irritating effect of the silk. These silk strands are quilted into the tendon of the muscle to be transferred. The tendon is then divided, and, with the silk strands attached, is passed by means of long forceps through the subcutaneous tissue and brought out through an incision at the point needed for periosteal insertion. The silk strands are then inserted by means of proper needles into the periosteum or bone tissue, the foot being placed in an over-corrected position. In some instances it may be well to supplement tendon transference with silk ligaments inserted, as already mentioned, after the operation. The limb should be held in a corrected or over-corrected position by means of plaster bandages, which are to be worn for several weeks, and followed by a suitable retention appliance, which is to be worn for several months.

In quadriceps paralysis of the knee-joint, the ham-strings can be transferred forward and inserted into the patella and into the ligamentum patellæ. In deltoid paralysis, strands of the trapezius have been transferred in such a way. In paralysis of the glutei muscles, the vastus or the rectus femoris have been utilized for transference, and also strands of the erector spinæ. In paralysis of the tibial muscles, the peronei have been transferred, and *vice versa*. In paralysis of the extensor communis of the foot, the flexors have been used, or portions of the tendo Achilles.

It is manifest that before this operation is performed all deformities should be corrected. The operation is one which should not be undertaken until it is certain that no spontaneous recovery, or partial recovery by use, is to be expected from any of the ordinary therapeutic measures devoted to the development of weakened muscles in this affection, but it is one devoid of danger and with a good promise of benefit in suitable cases.

The procedure of muscle and tendon transference requires strict attention to important details, for which the reader must be referred to a more complete description than is possible in this short article (Lange).

Prognosis in Cases under Treatment.

In an affection where recovery, sometimes rapid recovery, not infrequently takes place without treatment, and where spontaneous improvement is the rule in the months following the onset of the disease, it is difficult to determine the exact value of remedial measures. The arguments for measures stimulating the tissues affected are theoretical rather than demonstrable, yet they are based upon such sound reasoning that they should not be neglected but thoroughly applied.

The benefit to be obtained in the latest stages from the correction of deformity, in the use of proper appliances aiding in locomotion, in muscle transferrence and suitable operations, making the joints and limbs more serviceable for activity, is without question, and by no means inconsiderable in a large number of cases.

To give to the bed or chair ridden child, even by the employment of surgical skill, an active and useful life is a high achievement. It is one which is possible, in almost all instances, where the physician is able to enforce the thorough employment of the appropriate measures.

In infantile paralysis, marked improvement is the rule after the initial attack, and there is never a second attack.

The disease is a formidable one, but much can be done by the art of medicine to check or relieve its ravages.

NOTE. — The reader is referred for fuller particulars to the following important papers: —

Report of the Collective Investigation Committee on the New York Epidemic of 1907. Nervous and Mental Disease Monograph No. 6.

Annual Report of the Massachusetts State Board of Health for 1908.

Flexner and Lewis: Journal American Medical Association, Nov. 15, 1909; Dec. 4 and Dec. 18, 1909; Jan. 1 and Feb. 12, 1910.

Congrès Français de Chirurgie, 1907, p. 380.

Hoffa Archiv. für klin. Chir., lxxxi., 1.

Lange: Joachimsthal's Handbuch der Orth. Chir., Berlin, 1904.

Robert Jones: British Medical Journal, March 28, 1908.

Journal American Medical Association, Nov. 14, 1908.

American Journal Orthopedic Surgery, 1908, vi., pp. 184, 202, 319.

Boston Medical and Surgical Journal, Nov. 7, 1907; Nov. 14, 1907; June 4, 1908.

THE DIAGNOSIS OF INFANTILE PARALYSIS IN THE PRODROMAL AND EARLY ACUTE STAGE, AS FOUND IN THE EXPERIMENTAL STUDY OF ACUTE POLIOMYELITIS IN MONKEYS. WITH REPORT OF FINDINGS IN FOUR HUMAN CASES.[1]

By William Palmer Lucas, M.D., of Boston.

The past year has brought out so many interesting facts about the infectious nature of acute anterior poliomyelitis, its transmissibility, its epidemiology, and, recently, some valuable facts in experimental immunity, that now great efforts are being made to discover some means of protection. In view of such a discovery, and having failed thus far to find the specific etiological cause, it seems of some import to find some means of making a fairly accurate diagnosis early in the disease, as there is little or no hope of being able to check the process after paralysis has appeared. The invasion of the white matter of the cord is undoubtedly an end result of the acute process, so that when the paralysis is first observed the virus has already about spent itself. This being so, there must be some indication in almost every case that the virus is at work some time before the paralysis appears.

The New York investigation of the prodromal symptoms agrees completely with the early symptoms found in animal experimentation. The most noteworthy signs are those of change of disposition. At times slight, but fairly constant and characteristic, is the restlessness and irritability that often appears several days before any other symptoms. Or the other extreme of apathy may be moderately marked for a number of days before one is aware that the paralysis is present. In these cases the occurrence of paralysis is much harder to determine, or, at least, we are not so apt to notice it as early as in the irritative cases. The paralysis may even be ushered in with delirium and convulsions, or epileptiform attacks, which may last for several days before the paralysis is noted. In the exceedingly irritative cases the diagnosis of epidemic meningitis is most often made. And, indeed, it is really a distinct type of acute meningitic anterior poliomyelitis. Experimentally it is hard to be sure of pain, but pain in the prodromal stage is by no means an uncommon finding, most often in the back along the spine, or in the joints of the extremities, which may show swelling and tenderness. Headache, general or frontal, is not infrequently met with in children old enough to locate the pain, and this is often accompanied with rigidity of the neck. If with any of these nervous manifestations there should be any trouble

[1] Work done under a grant from the Proctor fund in the departments of Surgical Research and Serum Diagnosis, Harvard Medical School. Read before the Massachusetts Medical Society, June 8, 1910.

in the upper air passages, as coryza, bronchitis or sore throat, suspicion should at once be aroused. In all of our animals and in each of our four human cases there was some affection of the upper air passages along with one or more of the above nervous manifestations. Temperature, though present in nearly every case, is not typical, and is of little use as a guide. It is usually of short duration, two or three days, though a low temperature of about 100° may continue for a week or more, as may be seen in our four cases, in three of which it persisted for over three weeks. The bowels show no particular change in the majority of cases, though either constipation or a moderate diarrhœa may exist.

These clinical manifestations, in conjunction with certain definite laboratory findings which I have been able to show in an experimental study and in a few human cases that I had the good fortune to see about the same time, make the diagnosis somewhat more certain, though of course not as exact as some specific reaction, by which we had hoped to be able to make a positive diagnosis but in which so far we have failed. Yet this combined information should be of great assistance toward making a more accurate and early diagnosis in this condition.

Points of Diagnosis from Spinal Fluid and Blood in the Prodromal and Acute State of Anterior Poliomyelitis, from Experimental and Human Study.

The original material for experimental work was obtained through the kindness of Dr. Flexner, who furnished us with two different strains of virus. We were able to produce paralysis in three monkeys from this original virus, and were able to transfer paralysis through two subsequent series of inoculations. The work of diagnosis may be divided into two parts as we carried them out. First, the ordinary laboratory methods of blood and spinal fluid examination, and second, the more complicated biological tests of these same fluids. All these tests were made before the inoculation in a large enough number to give us a fair idea of what normal findings were. These same tests were carried on during the period of incubation, through the prodromal stage and through the acute stage, until the fluids examined returned apparently to their normal findings. The temperature findings were not constant, except that in the first irritative stage there was a fairly uniform rise, with a drop to normal, often subnormal, during the acute stage, with at times a further rise toward the end of the acute stage or beginning of convalescence.

The study of the blood brought out at least two very interesting facts, and when taken in conjunction with certain findings in the spinal fluid will certainly make a strong diagnostic point early in the disease. The normal differential count ran about, polynuclears, 60 per cent; large and

small mononuclears, 25 per cent; lymphocytes, 12 per cent; eosinophiles, 3 per cent. In the acute stage there was a moderate to a constant lymphocytosis, the count being polynuclears, 40 per cent.; large mononuclears, 15 per cent; lymphocytes, 40 per cent; eosinophiles, 5 per cent. Parallel with this lymphocytosis there was a marked and constant leukopenia. This drop in the white count lasted fairly consistently with the acute stage, disappearing about the time that the hyperæsthesia or other manifestations of the acute stage disappeared. The average normal count of our monkeys was in the neighborhood of 20,000 per cubic millimeter. This count did not change during the incubation period, but did change occasionally during the irritative or prodromal stage, when there was a marked or moderate drop in the white count. During the acute stage there was always a marked drop, the lowest count being 8,000, on the second day after paralysis was first noted.

Spinal Fluid.

The spinal fluid shows even more marked and very characteristic constant findings during the incubation period, prodromal and acute stage, disappearing about the time that the acute symptoms begin to subside, being at its height either in the prodromal stage or on the first or second day of the acute stage. Before inoculation it is often impossible to get even one drop of spinal fluid from a lumbar puncture; most of our attempts gave nothing more than dry taps. However, when successful, there were only one or two cells to be seen in an ordinary Thoma-Zeiss counting chamber, and on staining, these were apparently large mononuclears or plasma cells. During the incubation period there is a marked increase in the amount of fluid that may be obtained from lumbar puncture, and the cells in the fluid are very markedly and characteristically increased, anywhere from 100 to 300 cells per cubic millimeter. These cells are mainly of the large mononuclear type, with some polynuclear cells and lymphocytes. In the prodromal stage there is even a more marked increase in the cells, often reaching 1,000 per cubic millimeter. In this stage, also, polynuclears are still present, in some cases as high as 60 per cent, though the large mononuclears and lymphocytes were very evident. In the early acute stage the increase in cells is very marked. The cells are now, however, mostly of the lymphocytic or very early form of cells, and sometimes very hard to place, as they are apparently undifferentiated cells. As the cells decrease in number the polynuclears begin to return, and at the end of a week or ten days there are very few cells present, mostly large mononuclears with a few polynuclears. In the prodromal and acute stage there was at times a fibrin clot. This clot would disappear fairly early during the acute stage. Fluid in our monkeys was never under any great pressure, though the

amount was sometimes increased so that 5 cubic centimeters was easily withdrawn. This occurred fairly regularly in the meningeal type of the infection.

A comparison of these experimental findings with the findings in four cases of acute poliomyelitis in children is of considerable value. These four cases were seen first between the second and fifth day of the acute onset. When seen all of them were running a slight temperature and were still in the hyper-sensitive state, with paralysis just commencing, so that the first findings in these cases are comparable with our findings in the early acute stage of our experimental studies. It will be seen from the chart that the blood findings show from a moderate to a quite marked drop in the white blood count, with a lymphocytosis moderately marked in all but one of the cases, which was the one examined at the latest day. The spinal fluid findings are very interesting in all these cases from the fact that in two of them definite fibrin formation was present early, which disappeared rapidly in one and very slowly in the other. The increase in cells was marked in all at the first puncture, and in three of the cases increased slightly later on in the course of the acute stage. The increase of cells was still present in two cases as late as the twentieth day of the acute onset. The type of cells found was practically parallel with the findings of the experimental spinal fluids, the lymphocytes and small mononuclears predominating on the first examinations, later being replaced by large mononuclears, and in the last findings polynuclears were beginning to reappear.

TABLE 1. — *Noteworthy Prodromal Symptoms.*

1. Irritability.
2. Restlessness.
3. Pain in spine or extremities.
4. Apathy.

TABLE 2. — *Important Symptoms during Acute Stage.*

1. Fever, 100° to 106°. Duration of fever two to seven days.
2. Vomiting (25 per cent. in New York series).
3. Restlessness.
4. Apathy.
5. Rigidity of neck.
6. Headache (frontal).
7. Delirium.
8. Stupor.
9. Convulsions.
10. Photophobia.
11. Dysphagia.
12. Sluggish pupils.

13. General pain (early in 58 per cent.).
14. Absence of deep reflexes.
15. Cold extremities (vasomotor changes).

TABLE 3. — *Types of Acute Poliomyelitis (Wickman).*

1. Spinal poliomyelitic form.
   Sudden onset, followed by paralysis.
2. The ascending form (Landry's paralysis).
   Involvement of respiratory centers.
   Most fatal cases belong to this type.
3. The bulbar or pontine form.
   Nerves most often involved: facial, ocular, hypoglossal.
   May exist alone or with paralysis of extremities.
4. Encephalitic or cerebral form.
   May exist alone or with spinal involvement.
5. The ataxic form.
   Much like Friedreich's ataxia.
6. Polyneuritic form.
7. Meningitic form.
8. Abortive form.
   1. General infection.
   2. Symptoms of meningeal irritation.
   3. Cases of much pain like influenza.
   4. Cases with marked digestive disturbances.

TABLE 4. — *Intracranial Injections, producing Acute Poliomyelitis in Monkeys.*

Monkey No.	Material used.	Incubation.[1]	Prodromal Symptoms during —	Acute onset on —	Died on —	Type of Disease.
1, .	Virus (K. Flexner Lewis), 4 cubic centimeters.	7 days,	5 days; 2 days well.	12th day,	17th day; chloroformed.	Marked prodromata; spinal poliomyelitic form.
5, .	Emulsion cord (monkey), 12 cubic centimeters.	2 days,	1 day, . .	4th day,	6th day, .	Bulbar, pontine type; respiratory paralysis.
7, .	Emulsion cord No. 273, F. & L., 2 cubic centimeters.	5 days,	1 day, . .	7th day,	12th day,	Spinal poliomyelitic form.
9, .	Virus M. A. (F. L.), 6 cubic centimeters.	12 days,	2 days, .	15th day,	40th day,	Spinal poliomyelitic form.
12, .	Emulsion No. 273, (F. L.), 2 cubic centimeters.	4 days,	1 day, . .	6th day,	8th day, .	Spinal poliomyelitic form.
15, .	Emulsion cord (monkey) No. 5, 2 cubic centimeters.	7 days,	2 days, .	10th day,	10th day,	Meningitic form.

[1] Average, 6⅙ days.

TABLE 5. — *Spinal Fluid in Acute Poliomyelitis (Monkeys).*

Monkey No.	Normal.	During Incubation.	Prodromal.	Acute Stage.
1, .	Two cells seen, 1 large mononuclear, 1 small plasma cell.	6th day, 100 cells per cubic millimeter; large mononuclears, 40 per cent.; small (lymphocytes), 60 per cent.	10th day, 240 cells per cubic millimeter; large and small mononuclears, 60 per cent.; lymphocytes, 40 per cent.	14th day, 400 cells per cubic millimeter; mostly lymphocytes; 16th day, 60 cells per cubic millimeter; lymphocytes; a few polynuclears.
5, .	Dry tap, . .	– –	3d day, 1,000 cells per cubic millimeter; polynuclears, 60 per cent.; mononuclears, 40 per cent.	4th day, 800 cells per cubic millimeter; 5th day, 1,000 cells per cubic millimeter; lymphocytes and polynuclears; young cells undifferentiated.
7, .	No cells seen, .	– –	6th day, 160 cells per cubic millimeter; excess of large mononuclears.	7th day, 12 cells per cubic millimeter; lymphocytes; 8th day, 90 cells per cubic millimeter; lymphocytes; 12th day, 20 cells per cubic millimeter; large mononuclears: a few polynuclears.
9, .	One (?) plasma cell.	– –	14th day, 120 cells per cubic millimeter; lymphocytes, 40 per cent.; large mononuclears, 60 per cent.	16th day, 200 cells per cubic millimeter; all lymphocytes or small mononuclears (young cells).
12, .	Dry tap, . .	– –	– –	7th day, 80 cells per cubic millimeter; lymphocytes.
15, .	A few large cells and 1 (?) plasma cell.	6th day, 300 cells per cubic millimeter; large mononuclears, 60 per cent.	9th day, 150 cells per cubic millimeter; large mononuclears, 30 per cent.; lymphocytes, 60 per cent.; polynuclears 10 per cent.	10th day, 180 cells per cubic millimeter; lymphocytes; 30th day, few polynuclears found.

TABLE 6. — *Blood (W. B. C.) in Acute Poliomyelitis (Monkeys).*

Monkey No.	Normal.	During Incubation.	Prodromal.	Acute Stage.
1, .	W. B. C., 20,000,	Average W. B. C., 23,000.	11th day, 21,000, .	12th day, 19,000 (1st day). 14th day, 12,000 (3d day). 15th day, 11,800 (4th day). 16th day, 16,000 (5th day).
2, .	21,000, . . .	2d day, W. B. C., 21,400.	3d day, 22,400, .	4th day, 14,000 (1st day). 5th day, 19,000 (2d day).
7, .	40,000, . . .	2d day, W. B. C., 16,000.	6th day, W. B. C., 19,800.	7th day, 13,000 (1st day). 8th day, 8,000 (2d day). 12th day, 13,000 (6th day).
9, .	21,000, . . .	Average W. B. C., 19,000.	14th day, W. B. C., 13,000.	15th day, 14,000. 16th day, 9,000. 20th day, 12,000. 24th day, 19,400.
12, .	23,000, . . .	2d day, W. B. C., 23,200.	4th day, 23,000; 5th day, 18,000.	6th day, 18,000 (1st day). 7th day, 12,200 (2d day).
15, .	20,000, . . .	2d day, 48,000; 7th day, 39,000.	9th day, 19,000, .	10th day, 9,400 (1st day). 12th day, 11,800 (2d day).

Table 7.

Case 1.—R. R.

Day.	Temperature (Degrees).	Blood.	Spinal Fluid.
5th, . .	100.0	W. B. C., 17,400; differentiated lymphocytosis.	10 cubic centimeters; 180 cubic millimeters, no clot; lymphocytosis, 98 per cent.
8th, . .	100.0	W. B. C., 12,000; lymphocytosis.	20 cubic centimeters: 50 cubic millimeters, no clot; mononuclears, degenerated forms.
13th, . .	99.0	W. B. C., 11,600.	10 cubic centimeters; 80 cubic millimeters; no clot; large mononuclears and degenerated forms.

Case 2.

2d, . .	100.0	W. B. C., 10,000; lymphocytosis, 62 per cent.	5 cubic centimeters clear; clot in 24; 350 cells per cubic millimeter; degenerated mononuclears.
5th, . .	98.5	-	Blood fluid with clot. 20 cubic centimeters; very few leucocytes.
7th, . .	100.0	W. B. C., 7,800: lymphocytosis.	35 cubic centimeters bloody fluid; clot; few degenerated mononuclears.
9th, . .	99.5	W. B. C., 12,200.	- -
12th, . .	100.0	W. B. C., 11,800.	30 cubic centimeters; 1st lot clear; slight clot; 80 cells to cubic milliimeter; mononuclears; 3d lot opaque; clot; 580 cells to cubic millimeter; mononuclears and lymphocytes.

Case 3.

4th, . .	101.0	12,000; normal dif.	50 cubic centimeters clear; no clot: high pressure; 60 cells per cubic millimeter.
-	100.0	-	25 cubic centimeters clear; 510 cells per cubic millimeter; mononuclears and lymphocytes.
-	-	-	10 cubic centimeters clear; 240 cells per cubic millimeter.

Case 4.

4th, . .	99.0	13,400; differentiated polynuclears, 75.5; mononuclears, 24.5.	20 cubic centimeters clear; fibrin clot; 50 cells per cubic millimeter; degenerated small and large mononuclears.
5th, 9th, . .	-	-	30 cubic centimeters clear; fluid; 130 cells per cubic millimeter; mononuclears and lymphocytes.

TRANSPORTATION AND SALE OF MILK.

Acts of 1910, Chapter 633.

An Act relative to the transportation and sale of milk.

Be it enacted, etc., as follows:

Section 1. Section two hundred and two of Part II of chapter four hundred and sixty-three of the acts of the year nineteen hundred and six is hereby amended by striking out the words " fairly proportionate to ", in the tenth line, and by inserting the word: — same, — after the word " the ", in the tenth line, — so as to read as follows: — *Section 202.* A railroad corporation shall not receive, forward or deliver milk in large quantities over any portion of its line, or permit others so to do, under contract, lease or hiring of cars or otherwise, without at the same time providing, as regards time, care and preservation of the milk and the return of the empty cans, equal facilities and advantages for receiving, forwarding and delivering milk by the can over the same portion of its line; nor without establishing a tariff for the milk by the can which is the same rate which it charges or receives as aforesaid for milk in large quantities.

Section 2. Section two hundred and three of Part II of said chapter four hundred and sixty-three is hereby amended by striking out the words " unreasonably high, as compared with ", in the tenth line, and inserting in place thereof the words: — higher than, — and by striking out the words " in its judgment is fairly proportionate to ", in the twelfth and thirteenth lines, and inserting in place thereof the words: — it finds to be, — and by striking out all after the word " but ", in the eighteenth line, and inserting in place thereof the words: — the rates by the can so fixed shall not be higher than the rates charged by the same railroad corporation for a longer distance on any part of its system, — so as to read as follows: — *Section 203.* Upon the petition of one or more persons who desire to forward milk by the can over any railroad or any portion or portions thereof, the board of railroad commissioners, after notice to the railroad corporation and a hearing, shall ascertain and compare the tariff established as aforesaid for milk by the can with the rate charged or received as aforesaid for milk in large quantities over such railroad or such portion or portions thereof; and if the former is, in the judgment of said board, higher than the latter, said board shall revise said tariff and shall fix such rate for milk by the can as it finds to be the rate for milk in large quantities, including in both cases the same care and preservation of the milk and the return of the empty cans, as aforesaid; and shall notify the corporation in writing of the rate by the can so fixed over such railroad or such portion or portions thereof; but the rates by the can so fixed shall not be higher than the rates charged by the same railroad corporation for a longer distance on any part of its system.

Section 3. No milk shall be sold in this commonwealth unless the conditions under which it is produced are subject to the inspection provided for by the laws of the commonwealth.

Section 4. This act shall take effect on the first day of August, nineteen hundred and ten. [*Approved June 15, 1910.*

INSPECTION OF COLD STORAGE AND REFRIGERATING WAREHOUSES.

Acts of 1910, Chapter 640.

An Act to provide for inspection by boards of health of cold storage and refrigerating warehouses.

Be it enacted, etc., as follows:

Section 1. Boards of health of cities or towns, by themselves, their officers or agents, shall make frequent inspection of all cold storage or refrigerating warehouses used for the storage of food products, and for this purpose shall have all the powers of entry now conferred by law for purposes of such inspection.

Section 2. This act shall take effect upon its passage. [*Approved June 15, 1910.*

LIABILITY OF PRODUCERS OF MILK.

Acts of 1910, Chapter 641.

An Act relative to the liability of producers of milk.

Be it enacted, etc., as follows:

Section 1. Section sixty-two of chapter fifty-six of the Revised Laws is hereby amended by adding at the end thereof the words: — nor unless he shall fail to bring the milk produced by him to the legal standard for milk solids and milk fat within twenty days after written notice has been sent from the officer taking said sample that it is below said standard. At any time after the said period of twenty days allowed the producer to bring his milk to the legal standard has elapsed the officer taking the first sample may take a second sample, and if it shall be found to be below the legal standard for milk solids and milk fat prosecution may follow, — so as to read as follows: — *Section 62.* A producer of milk shall not be liable to prosecution for the reason that the milk produced by him is not of good standard quality unless such milk was taken upon his premises or while in his possession or under his control by an inspector of milk, by a collector of samples of milk, or by an agent of the dairy bureau or of the state board of health, and a sealed sample thereof

was given to him, nor unless he shall fail to bring the milk produced by him to the legal standard for milk solids and milk fat within twenty days after written notice has been sent from the officer taking said sample that it is below said standard. At any time after the said period of twenty days allowed the producer to bring his milk to the legal standard has elapsed the officer taking the first sample may take a second sample, and if it shall be found to be below the legal standard for milk solids and milk fat prosecution may follow.

SECTION 2. Section fifty-seven of said chapter fifty-six is hereby amended by striking out in the eighth line thereof the words "fifty dollars and", and inserting in place thereof the words: — not more than two hundred dollars or, — and by striking out in the eighth and ninth lines thereof the words "less than sixty nor." [*Approved June 15, 1910.*

PROPRIETARY PREPARATION ADVERTISED AS UNSALABLE IN JULY, 1910.

Vino de Quina y Cacao del Dr. Castillo Gutierrez Hermanos, Jerez.

Highland Malt Extract. The Springfield Breweries Company, Springfield, Mass., U. S. A.

REGULATIONS CONCERNING THE USE OF THE COMMON DRINKING CUP.

At a meeting of the State Board of Health held on July 21, 1910, the following regulations were made concerning the use of the common drinking cup, in accordance with the provisions of chapter 428 of the Acts of 1910: —

On and after Oct. 1, 1910, it shall be unlawful to provide a common drinking cup: —

(*a*) In any public park, street or way.

(*b*) In any building or premises used as a public institution, hotel, theatre, public hall or public school.

(*c*) In any railroad station, railroad car, steam or ferry boat.

MONTHLY BULLETIN

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Approved by
The State Board of Publication.

WEEKLY RETURNS OF DEATHS FROM CITIES AND TOWNS OF MORE THAN 10,000 POPULATION.

WEEK ENDING JULY 2, 1910.

CITIES AND TOWNS.	Population.[1] Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	188	66	55	17	18	1	1	2
Worcester,	136,476	48	23	14	5	2	–	–	–
Fall River,	106,486	63	40	43	5	5	–	–	2
Cambridge,	102,112	20	6	9	4	3	–	–	–
Lowell,	96,380	45	23	25	3	–	–	–	–
New Bedford,	85,516	44	26	16	2	–	1	–	–
Lynn,	84,623	12	3	2	1	1	–	–	–
Springfield,	84,237	27	10	16	1	4	1	1	–
Lawrence,	78,000	35	21	17	1	1	–	–	–
Somerville,	76,049	21	4	7	1	3	–	–	–
Brockton,	55,039	13	3	6	2	1	–	–	–
Holyoke,	53,590	19	10	10	1	3	–	1	–
Malden,	41,941	12	1	2	–	2	–	–	–
Chelsea,	40,080	12	3	3	–	–	1	–	–
Newton,	39,642	8	3	3	–	1	2	–	–
Salem,	39,019	11	7	2	–	2	–	–	–
Haverhill,	38,362	15	5	4	–	1	–	–	–
Fitchburg,	34,263	10	5	1	–	1	–	–	–
Everett,	33,597	4	1	–	–	–	–	–	–
Quincy,	31,937	5	–	1	–	–	–	–	–
Taunton,	30,967	11	1	2	1	1	–	–	–
Waltham,	28,761	8	3	–	–	–	–	–	–
Pittsfield,	27,932	4	–	–	–	–	–	–	–
Brookline,	26,674	5	–	1	–	1	–	–	–
Gloucester,	26,011	4	–	2	–	–	1	–	–
North Adams,	22,150	7	–	1	–	–	–	1	–
Northampton,	21,075	5	1	–	–	–	–	–	–
Chicopee,	21,049	9	6	2	–	–	–	–	–
Medford,	20,921	5	–	1	–	–	1	–	–
Beverly,	16,386	5	–	2	2	–	–	–	–
Leominster,	16,030	3	–	–	–	–	–	–	–
Hyde Park,	15,609	5	2	3	1	1	–	–	–
Melrose,	15,459	4	0	1	–	1	–	–	–
Newburyport,	14,834	6	–	–	–	–	–	–	–
Revere,	14,820	2	1	1	1	–	–	–	–
Westfield,	14,750	13	2	7	–	7	–	–	–
Woburn,	14,522	2	0	1	–	1	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	5	1	1	–	–	–	–	–
Attleborough,	13,913	3	1	1	–	1	–	–	–
Adams,	13,685	3	1	2	–	–	1	–	–
Clinton,	13,105	3	1	1	–	–	–	–	–
Gardner,	13,066	4	3	1	1	–	–	–	–
Milford,	12,722	1	1	–	–	–	–	–	–
Watertown,	12,676	2	2	–	–	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	1	–	–	–	–	–	–	–
Weymouth,	11,798	2	–	–	–	–	–	–	–
Framingham,	11,749	2	0	–	–	–	–	–	–
Wakefield,	11,124	0	–	–	–	–	–	–	–
Webster,	11,109	3	1	1	–	–	–	–	–
Arlington,	10,520	2	1	–	–	–	–	–	–
Greenfield,	10,140	0	–	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,401,701	741	288	267	49	61	9	4	4

[1] The populations were estimated upon the rate of growth from 1900 to 1905. Those of Taunton, Gloucester, North Adams and Clinton were allowed to stand as in 1905, having shown no increase during the five-year period. The gain in the population of Lowell is due to the annexation of a part of the town of Tewksbury. The population of Lawrence by the census of 1905 was 70,050, but, owing to the building of the new Wood and Arlington mills, an increase of about 8,000 is estimated by the Lawrence Board of Health, or 78,000.

WEEK ENDING JULY 9, 1910.

CITIES AND TOWNS.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	220	71	79	25	20	4	2	2
Worcester,	136,476	48	24	8	4	1	–	–	–
Fall River,	106,486	79	50	64	6	7	–	–	2
Cambridge,	102,112	26	9	8	2	5	–	–	–
Lowell,	96,380	49	30	24	–	1	–	–	–
New Bedford,	85,516	50	36	32	2	3	–	–	–
Lynn,	84,623	12	2	–	–	–	–	–	–
Springfield,	84,237	27	11	9	1	1	–	–	–
Lawrence,	78,000	35	21	21	1	2	–	–	–
Somerville,	76,049	18	4	4	1	1	–	–	–
Brockton,	55,039	15	6	6	2	1	–	–	–
Holyoke,	53,590	19	10	8	–	–	1	1	–
Malden,	41,941	7	2	1	–	1	–	–	–
Chelsea,	40,080	5	2	–	–	–	–	–	–
Newton,	39,642	2	1	–	–	–	–	–	–
Salem,	39,019	16	6	2	1	1	–	–	–
Haverhill,	38,362	6	4	3	1	–	–	–	–
Fitchburg,	34,263	8	4	–	–	–	–	–	–
Everett,	33,597	4	1	–	–	–	–	–	–
Quincy,	31,937	3	–	–	–	–	–	–	–
Taunton,	30,967	14	5	3	2	–	–	–	1
Waltham,	28,761	5	–	2	1	1	–	–	–
Pittsfield,	27,932	13	–	1	–	–	–	–	–
Brookline,	26,674	4	1	2	1	–	–	–	–
Gloucester,	26,011	3	2	–	–	–	–	–	–
North Adams,	22,150	7	5	4	–	–	–	–	–
Northampton,	21,075	4	2	3	–	1	–	–	–
Chicopee,	21,049	18	10	4	1	1	–	–	–
Medford,	20,921	7	–	–	–	–	–	–	–
Beverly,	16,386	4	–	3	–	3	–	–	–
Leominster,	16,030	4	1	1	–	–	–	1	–
Hyde Park,	15,609	9	3	5	1	2	–	–	–
Melrose,	15,459	2	0	1	–	–	–	–	–
Newburyport,	14,834	3	–	–	–	–	–	–	–
Revere,	14,820	3	–	1	1	–	–	–	–
Westfield,	14,750	2	2	–	–	–	–	–	–
Woburn,	14,522	7	2	–	–	–	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	2	1	1	–	1	–	–	–
Attleborough,	13,913	4	1	3	–	2	–	–	–
Adams,	13,685	2	1	–	–	–	–	–	–
Clinton,	13,105	3	2	–	–	–	–	–	–
Gardner,	13,066	3	0	–	–	–	–	–	–
Milford,	12,722	2	1	–	–	–	–	–	–
Watertown,	12,676	2	0	–	–	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	6	1	–	–	–	–	–	–
Weymouth,	11,798	1	–	–	–	–	–	–	–
Framingham,	11,749	4	0	–	–	–	–	–	–
Wakefield,	11,124	0	–	–	–	–	–	–	–
Webster,	11,109	5	2	3	–	2	–	–	–
Arlington,	10,520	3	1	–	–	–	–	–	–
Greenfield,	10,140	2	–	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,401,701	797	337	306	53	57	5	4	5

WEEK ENDING JULY 16, 1910.

CITIES AND TOWNS.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	221	67	72	18	21	3	1	2
Worcester,	136,476	56	25	12	8	2	–	–	–
Fall River,	106,486	99	58	66	1	3	–	2	4
Cambridge,	102,112	35	6	16	–	7	2	–	–
Lowell,	96,380	64	44	41	2	1	2	–	–
New Bedford,	85,516	59	43	39	2	2	–	–	–
Lynn,	84,623	24	9	4	1	2	–	–	–
Springfield,	84,237	40	13	17	4	–	–	–	–
Lawrence,	78,000	37	24	26	–	3	–	1	–
Somerville,	76,049	17	5	8	–	2	1	–	–
Brockton,	55,039	14	3	4	1	–	2	–	–
Holyoke,	53,590	18	13	10	–	1	–	–	–
Malden,	41,941	9	5	1	–	–	–	–	–
Chelsea,	40,080	11	1	2	1	1	–	–	–
Newton,	39,642	10	1	–	–	–	–	–	–
Salem,	39,019	14	7	4	1	3	–	–	–
Haverhill,	38,362	12	7	3	1	–	–	–	–
Fitchburg,	34,263	10	3	2	–	–	1	–	–
Everett,	33,597	5	1	1	–	–	1	–	–
Quincy,	31,937	6	3	3	3	–	–	–	–
Taunton,	30,967	20	7	11	1	3	–	–	–
Waltham,	28,761	10	3	1	–	1	–	–	–
Pittsfield,	27,932	15	5	3	1	–	–	–	–
Brookline,	26,674	6	1	–	–	–	–	–	–
Gloucester,	26,011	8	–	2	–	1	–	–	–
North Adams,	22,150	3	2	2	1	–	–	–	–
Northampton,	21,075	7	2	2	–	–	–	–	–
Chicopee,	21,049	22	15	7	1	–	–	–	–
Medford,	20,921	5	1	2	–	1	–	–	–
Beverly,	16,386	6	1	–	–	–	–	–	–
Leominster,	16,030	1	1	–	–	–	–	–	–
Hyde Park,	15,609	3	1	1	–	–	–	–	–
Melrose,	15,459	4	3	2	–	–	–	–	–
Newburyport,	14,834	4	1	–	–	–	–	–	–
Revere,	14,820	3	2	1	1	–	–	–	–
Westfield,	14,750	5	1	2	–	2	–	–	–
Woburn,	14,522	4	1	–	–	–	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	4	2	2	–	1	–	–	–
Attleborough,	13,913	1	1	1	–	–	–	–	–
Adams,	13,685	11	7	5	–	–	–	–	–
Clinton,	13,105	3	–	1	–	1	–	–	–
Gardner,	13,066	7	3	1	–	1	–	–	–
Milford,	12,722	5	3	3	–	–	–	–	–
Watertown,	12,676	1	1	–	–	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	0	–	–	–	–	–	–	–
Weymouth,	11,798	4	–	–	–	–	–	–	–
Framingham,	11,749	4	2	2	1	–	–	–	–
Wakefield,	11,124	1	–	–	–	–	–	–	–
Webster,	11,109	4	4	3	–	–	–	–	–
Arlington,	10,520	1	–	–	–	–	–	–	–
Greenfield,	10,140	8	0	3	2	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,401,701	941	408	388	51	59	12	4	6

WEEK ENDING JULY 23, 1910.

CITIES AND TOWNS.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	185	62	72	14	22	4	1	1
Worcester,	136,476	39	21	11	2	–	1	–	1
Fall River,	106,486	77	38	52	7	5	1	1	–
Cambridge,	102,112	31	18	14	2	4	–	–	–
Lowell,	96,380	58	30	36	1	4	–	–	–
New Bedford,	85,516	55	40	35	1	1	–	–	–
Lynn,	84,623	21	3	5	1	3	–	–	–
Springfield,	84,237	37	17	14	2	2	–	–	–
Lawrence,	78,000	40	25	24	4	–	–	–	–
Somerville,	76,049	17	4	7	–	2	1	–	–
Brockton,	55,039	12	5	3	2	1	–	–	–
Holyoke,	53,590	18	10	9	2	–	–	–	–
Malden,	41,941	8	4	4	1	2	–	–	–
Chelsea,	40,080	6	1	–	–	–	–	–	–
Newton,	39,642	2	–	1	–	1	–	–	–
Salem,	39,019	11	4	–	–	–	–	–	–
Haverhill,	38,362	15	4	7	–	–	–	–	–
Fitchburg,	34,263	12	8	1	–	–	–	–	–
Everett,	33,597	6	1	–	–	–	–	–	–
Quincy,	31,937	5	2	1	–	1	–	–	–
Taunton,	30,967	19	5	8	2	1	–	–	1
Waltham,	28,761	7	1	2	–	–	1	–	–
Pittsfield,	27,932	9	1	2	–	–	–	1	–
Brookline,	26,674	6	0	1	–	1	–	–	–
Gloucester,	26,011	5	2	1	–	–	–	–	–
North Adams,	22,150	4	2	–	–	–	–	–	–
Northampton,	21,075	7	1	3	–	–	–	–	–
Chicopee,	21,049	11	7	8	–	–	–	–	–
Medford,	20,921	1	–	–	–	–	–	–	–
Beverly,	16,386	4	–	–	–	–	–	–	–
Leominster,	16,030	–	–	–	–	–	–	–	–
Hyde Park,	15,609	5	3	3	–	1	–	–	–
Melrose,	15,459	6	2	4	–	1	1	–	–
Newburyport,	14,834	4	–	2	–	1	–	1	–
Revere,	14,820	5	4	3	–	–	–	–	–
Westfield,	14,750	6	4	1	–	1	–	–	–
Woburn,	14,522	5	2	2	–	1	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	2	0	–	–	–	–	–	–
Attleborough,	13,913	7	2	1	–	–	–	–	–
Adams,	13,685	5	5	2	–	–	–	–	–
Clinton,	13,105	7	1	1	–	1	–	–	–
Gardner,	13,066	5	3	2	–	–	–	–	–
Milford,	12,722	4	2	2	–	–	–	–	–
Watertown,	12,676	3	2	1	–	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	3	–	–	–	–	–	–	–
Weymouth,	11,798	2	1	–	–	–	–	–	–
Framingham,	11,749	6	1	–	–	–	–	–	–
Wakefield,	11,124	1	1	–	–	–	–	–	–
Webster,	11,109	3	2	3	–	1	–	–	–
Arlington,	10,520	2	–	–	–	–	–	–	–
Greenfield,	10,140	3	0	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,401,701	812	351	348	41	57	9	4	2

Week ending July 30, 1910.

Cities and Towns.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	Deaths from—					
				Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	216	72	78	10	15	2	1	2
Worcester,	136,476	67	31	19	7	4	–	–	–
Fall River,	106,486	56	40	38	10	6	–	–	–
Cambridge,	102,112	43	13	19	2	8	–	1	–
Lowell,	96,380	39	15	18	1	3	–	2	–
New Bedford,	85,516	43	31	28	–	2	–	–	–
Lynn,	84,623	25	13	2	–	2	–	–	–
Springfield,	84,237	28	9	9	1	2	–	–	–
Lawrence,	78,000	34	19	26	2	2	–	–	–
Somerville,	76,049	18	5	6	1	1	–	–	–
Brockton,	55,039	14	4	3	–	–	–	–	–
Holyoke,	53,590	35	17	17	–	2	–	–	–
Malden,	41,941	15	7	3	1	–	–	–	–
Chelsea,	40,080	8	2	1	–	1	–	–	–
Newton,	39,642	9	0	2	–	2	–	–	–
Salem,	39,019	18	6	2	1	1	–	–	–
Haverhill,	38,362	10	6	6	1	1	–	–	–
Fitchburg,	34,263	12	5	1	–	–	–	1	–
Everett,	33,597	6	4	3	–	–	–	–	–
Quincy,	31,937	6	2	2	–	1	–	–	–
Taunton,	30,967	21	13	13	–	1	–	–	–
Waltham,	28,761	10	2	1	1	–	–	–	–
Pittsfield,	27,932	8	3	3	–	–	–	1	–
Brookline,	26,674	6	1	1	–	–	–	–	–
Gloucester,	26,011	11	1	1	–	1	–	–	–
North Adams,	22,150	13	7	5	2	–	–	–	–
Northampton,	21,075	4	2	2	–	–	–	–	–
Chicopee,	21,049	16	13	8	–	–	–	–	1
Medford,	20,921	7	1	–	–	–	–	–	–
Beverly,	16,386	1	–	–	–	–	–	–	–
Leominster,	16,030	1	–	–	–	–	–	–	–
Hyde Park,	15,609	5	2	1	–	–	–	–	–
Melrose,	15,459	7	3	2	–	–	–	–	–
Newburyport,	14,834	8	–	–	–	–	–	–	–
Revere,	14,820	7	1	1	–	1	–	–	–
Westfield,	14,750	8	6	–	–	–	–	–	–
Woburn,	14,522	14	4	5	–	–	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	5	1	1	–	–	–	–	–
Attleborough,	13,913	7	3	3	–	–	–	–	–
Adams,	13,685	12	7	7	–	1	–	–	–
Clinton,	13,105	5	1	–	–	–	–	–	–
Gardner,	13,066	4	2	1	–	–	–	–	–
Milford,	12,722	5	3	3	–	–	–	–	–
Watertown,	12,676	0	–	–	–	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	5	–	3	–	–	–	–	–
Weymouth,	11,798	–	–	–	–	–	–	–	–
Framingham,	11,749	3	2	1	–	–	–	–	–
Wakefield,	11,124	3	1	2	–	–	–	–	–
Webster,	11,109	3	1	–	–	–	–	–	–
Arlington,	10,520	4	1	1	–	1	–	–	–
Greenfield,	10,140	4	0	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,389,903	909	382	348	40	58	2	6	4

WEEKLY RETURNS OF DEATHS FROM CERTAIN INFECTIOUS DISEASES.

DEATHS FROM INFECTIOUS DISEASES NOT SPECIFICALLY MENTIONED IN ABOVE TABLES DURING THE WEEKS OF JULY 2, 9, 16, 23 AND 30, 1910.

DISEASE.	Place.	WEEK ENDING —				
		July 2.	July 9.	July 16.	July 23.	July 30.
Cerebro-spinal meningitis,	Boston,	1	2	1	1	–
	Brockton,	1	1	–	–	1
	Hyde Park,	1	–	–	–	–
	Lawrence,	–	–	–	–	1
	New Bedford,	–	1	–	–	–
	Springfield,	1	–	–	–	–
	Worcester,	–	–	–	1	2
Scarlet fever,	Adams,	1	–	–	–	–
	Boston,	1	2	–	–	1
	Brockton,	1	–	–	–	–
	Cambridge,	–	–	1	–	–
	Fitchburg,	–	–	1	1	–
	Lowell,	2	1	–	1	–
	Malden,	–	–	1	–	–
	Somerville,	–	1	1	–	–
	Worcester,	1	–	–	–	–
Whooping cough,	Boston,	–	1	1	1	2
	Cambridge,	–	–	–	1	–
	Everett,	–	–	–	–	1
	Fall River,	–	–	–	1	–
	Haverhill,	–	–	–	1	1
	Holyoke,	–	–	1	–	–
	Hyde Park,	–	1	–	–	1
	Lawrence,	–	3	2	–	–
	Lowell,	–	–	–	1	–
	Northampton,	–	1	–	–	–
	Pittsfield,	–	–	1	–	–
	Springfield,	1	–	–	1	1
	Worcester,	–	–	1	1	1
Erysipelas,	Boston,	3	3	1	–	–
	Haverhill,	–	–	1	–	–
	Holyoke,	–	1	–	–	–
	Lawrence,	1	–	–	–	–
	Lynn,	–	–	1	–	–
	Worcester,	–	–	–	1	–
Tuberculosis other than pulmonary.	Attleborough,	–	1	–	–	–
	Boston,	3	6	4	3	1
	Brookline,	–	1	–	–	–
	Chelsea,	2	–	–	–	–
	Chicopee,	–	1	–	–	–
	Fall River,	1	–	–	–	–
	Gloucester,	1	–	1	–	–
	Lawrence,	1	–	–	–	–
	Lowell,	–	1	1	1	–

DEATHS FROM INFECTIOUS DISEASES, ETC. — *Concluded.*

DISEASE.	Place.	WEEK ENDING — July 2.	July 9.	July 16.	July 23.	July 30.
Tuberculosis other than pulmonary — *Concluded.*	Marlborough,	–	–	1	–	–
	Medford,	–	–	1	–	–
	Melrose,	–	–	–	2	–
	Northampton,	–	–	–	2	–
	Pittsfield,	–	–	–	1	–
	Revere,	–	–	–	1	–
	Somerville,	2	–	–	–	–
	Taunton,	–	–	1	–	–
	Wakefield,	–	–	–	–	1
	Waltham,	–	–	–	1	–
	Woburn,	–	–	–	1	1
	Worcester,	1	–	1	1	1
Meningitis other than cerebro-spinal.	Brockton,	1	–	–	–	–
	Milford,	–	–	–	–	1
	North Adams,	–	1	–	–	–
	Pittsfield,	–	1	–	–	–
	Watertown,	–	–	–	1	–
Tetanus,	Greenfield,	–	–	1	–	–
Anterior poliomyelitis,	Fall River,	–	–	1	1	–
	Haverhill,	–	–	–	1	–
	Holyoke,	–	–	–	1	1
	Springfield,	–	2	4	3	4

WEEKLY RETURNS OF CASES OF INFECTIOUS DISEASES.

CASES OF INFECTIOUS DISEASES REPORTED DURING THE WEEKS OF JULY 2, 9, 16, 23 AND 30, 1910.

[Under the provisions of section 52 of chapter 75 of the Revised Laws.]

	WEEK ENDING —					
	July 2.	July 9.	July 16.	July 23.	July 30.	Total.
Diphtheria,	92	115	98	98	78	481
Measles,	384	278	172	121	94	1,049
Scarlet fever,	87	72	67	77	82	385
Typhoid fever,	19	39	59	37	54	208
Tuberculosis, pulmonary,	191	123	189	189	150	842
Tuberculosis other than pulmonary,	1	3	1	1	–	6
Cerebro-spinal meningitis,	2	2	2	2	1	9
Meningitis other than cerebro-spinal,	2	–	–	–	1	3
Whooping cough,	19	28	44	40	23	154
Varicella,	40	16	22	12	7	97
Erysipelas,[1]	–	1	2	–	–	3
Mumps,[1]	6	8	12	5	2	33
Ophthalmia neonatorum,	3	6	10	5	7	31
Smallpox,	–	1	–	–	1	2
Anterior poliomyelitis,	20	22	35	28	63	168
Tetanus,	–	1	1	–	1	3
Actinomycosis,	–	1	–	–	–	1
Malaria,	–	–	1	1	–	2

[1] Erysipelas and mumps are not diseases notifiable under section 52 of chapter 75 of the Revised Laws. The figures concerning these diseases are, therefore, incomplete.

MONTHLY REPORT ON INSPECTION OF FOOD AND DRUGS.

The following summary presents the results of the examination of food and drugs made by the State Board of Health during the month of July, 1910: —

ARTICLES EXAMINED.	Number found to be of Good Quality.	Number adulterated or varying from the Legal Standard.	Total.	ARTICLES EXAMINED.	Number found to be of Good Quality.	Number adulterated or varying from the Legal Standard.	Total.
Baking powder,	1	–	1	Milk,	258	210	468
Butter,	2	–	2	Non-alcoholic drinks,	2	–	2
Canned fruit,	1	–	1	Olive oil,	3	1	4
Canned fish,	5	–	5	Pastry (ice cream cones),	5	–	5
Cider,	1	–	1	Peanut butter,	1	–	1
Coffee,	1	–	1	Proprietary foods,	–	2	2
Condensed milk,	3	–	3	Pickles,	1	–	1
Cream,	18	–	18	Syrup,	10	–	10
Drugs,	50	16	66	Vinegar,	39	24	63
Extract of lemon,	–	1	1				
Grape juice,	1	–	1	Total,	420	256	676
Honey,	4	–	4				
Jams and jellies,	5	–	5				
Lard,	1	–	1				
Meats (canned),	2	–	2				
Sausages,	6	2	8				

The samples of drugs found to be adulterated were: alcohol, chlorinated lime, camphor liniment, whiskey, tincture iodine and two proprietary medicines.

The cities and towns in which samples were collected were: Bedford, Billerica, Boston, Braintree, Bridgewater, Brockton, Cambridge, Concord, Dedham, Dighton, Easthampton, Easton, Edgartown, Everett, Fairhaven, Fall River, Fitchburg, Hingham, Holliston, Hull, Lowell, Lynn, Malden, Marshfield, Maynard, Medfield, Melrose, Milford, Milton, New Bedford, Oak Bluffs, Quincy, Salem, Salisbury, South Framingham, Somerset, Stoneham, Sudbury, Vineyard Haven, Westport, Woburn and Worcester.

PROSECUTIONS FOR VIOLATIONS OF THE LAW RELATING TO FOOD AND DRUGS.

Nine convictions were secured during the month of July, 1910, for selling adulterated food, as follows: —

No.	Name of Defendant.	Place.	Character of Article sold.
1	Walter F. Beal,	Mendon,	Milk (total solids, 11.46).[1]
2	Edward A. Butters,	Bedford,	Milk (total solids, 10.08).[2]
3	George H. Doe,	Milford, Ct.	Milk (total solids, 10.50).
4	George H. Doe,	Milford, Ct.	Milk (total solids, 9.70).[1]
5	John J. Dwyer,	Sudbury,	Milk.
6	Edward E. Ford,	Milton,	Milk (total solids, 9.66).[1]
7	Hubert P. Pomery,	S. Framingham,	Milk (total solids, 11.36).[1]
8	John E. Willard,	Leominster,	Milk (total solids, 10.75).[1]
9	John E. Willard,	Leominster,	Milk (total solids, 10.78).

[1] Watered. [2] Skimmed.

Fines imposed, $350.

LIST OF ADULTERATED OR IMPROPERLY LABELED FOODS, ETC., FOR JULY, 1910.

Number of Sample.	Character of Sample.	Name of Manufacturer, Wholesaler or Producer.	Results of Analyses.
12589	Coleman's pure extract of lemon.	Coleman Specialty Company, Boston, Mass., . . .	No lemon oil present.
4757 R	"Torelli" pure olive oil.	Olio Puro D'Oliva Garantito, ...	Cotton-seed oil.
12150	"Dowst" pure cider vinegar.	John A. Dowst's Son Company, Brooklyn, N. Y., . .	Not cider vinegar.
4857 R	Vinegar, . . .	United Grocers Association, Vadeboncoeur Bros., Fall River.	Artificially colored.
12529	Vino de Quina y Cacao,	Gutierrez Bros,, Jerez, ...	Contained 18.03 per cent. alcohol by volume.
12585	Highland Malt Extract,	Springfield Breweries Company, Springfield, Mass , .	Contained 6.71 per cent. alcohol by volume.
12611	Az-Ma-Syde, . .	Asthma Remedy and Manufacturing Company, Cornelia, Ga.	Contained cocaine.
12612	Az-Ma-Syde Capsules, .	Asthma Remedy and Manufacturing Company, Cornelia, Ga.	Contained acetanilide.
12511	Milk, ...	John C. Moynihan, Maynard, Mass., ...	Total solids, 11.10 per cent.; fat, 3.20 per cent.; contained added water.
12554	Milk, ...	Amos P. Best, Dracut, Mass., ...	Total solids, 11.72 per cent.; fat, 4.15 per cent.; contained added water.
12564	Milk, ...	Joseph Chenelle, Lowell, Mass., ...	Total solids, 11.00 per cent.; fat, 3.50 per cent.; contained added water.
q 5197	Milk, ...	Walter F. Adams, Fitchburg, Mass., ...	Total solids, 10.22 per cent.; fat, 2.80 per cent.; contained added water.
q 5233	Milk, ...	Morris & Charles Wineapple, Salem, Mass., . . .	Total solids, 9.60 per cent.; fat, 2.85 per cent.; contained added water.
12597	Milk, ...	A. S. Furtado, Fall River, Mass., ...	Total solids, 10.71 per cent.; fat, 3.50 per cent.; contained added water.
12593	Milk, ...	Viner N. Paquette, Swansea, Mass., ...	Total solids, 10.24 per cent.; fat, 2.75 per cent.; contained added water.
12614	Milk, ...	Stephen Harvey, Hingham, Mass., ...	Total solids, 10.59 per cent.; fat, 3.00 per cent.; contained added water.

q 5259			Total solids, 10.90 per cent.; fat, 3.40 per cent.; contained added water.
q 5260			Total solids, 10.40 per cent.; fat, 3.15 per cent.; contained added water.
q 5261			Total solids, 10.90 per cent.; fat, 3.40 per cent.; contained added water.
q 5262			Total solids, 9.66 per cent.; fat, 2.40 per cent.; contained added water.
q 5263			Total solids, 10.54 per cent.; fat, 3.00 per cent.; contained added water.
q 5264			Total solids, 10.74 per cent.; fat, 3.25 per cent.; contained added water.
q 5265			Total solids, 10.44 per cent.; fat, 3.10 per cent.; contained added water.
q 5266			Total solids, 9.90 per cent.; fat, 2.70 per cent.; contained added water.
q 5267			Total solids, 10.90 per cent.; fat, 3.35 per cent.; contained added water.
q 5268			Total solids, 10.68 per cent.; fat, 3.10 per cent.; contained added water.
q 5269	Milk, ...	Edward E. Ford, Milton, Mass., ...	Total solids, 10.56 per cent.; fat, 3.00 per cent.; contained added water.
q 5270			Total solids, 10.80 per cent.; fat, 3.35 per cent.; contained added water.
q 5271			Total solids, 10.70 per cent.; fat, 3.20 per cent.; contained added water.
q 5272			Total solids, 10.34 per cent.; fat, 2.80 per cent.; contained added water.
q 5273			Total solids, 9.70 per cent.; fat, 2.40 per cent.; contained added water.
q 5274			Total solids, 10.54 per cent.; fat, 3.00 per cent.; contained added water.
q 5275			Total solids, 10.56 per cent.; fat, 3.20 per cent.; contained added water.
q 5276			Total solids, 10.76 per cent.; fat, 3.40 per cent.; contained added water.
q 5277			Total solids, 10.30 per cent.; fat, 3.00 per cent.; contained added water.
q 5278			Total solids, 10.60 per cent.; fat, 3.20 per cent.; contained added water.
q 5279			Total solids, 10.50 per cent.; fat, 3.20 per cent.; contained added water.

Number of Sample.	Character of Sample.	Name of Manufacturer, Wholesaler or Producer.	Results of Analyses.
12620	Milk, ...	John J. Dwyer, North Sudbury, Mass., . . .	Total solids, 10.42 per cent.; fat, 2.70 per cent.; contained added water.
12621			Total solids, 10.84 per cent.; fat, 3.30 per cent.; contained added water.
12622			Total solids, 10.92 per cent.; fat, 3.40 per cent.; contained added water.
12623			Total solids, 10.77 per cent.; fat, 3.20 per cent.; contained added water.
12624			Total solids, 10.92 per cent.; fat, 3.30 per cent.; contained added water.
12625			Total solids, 10.90 per cent.; fat, 3.20 per cent.; contained added water.
5752 N	Milk, ...	Antonio F. Durant, Vineyard Haven, Mass., . . .	Total solids, 11.45 per cent.; fat, 4.40 per cent.; contained added water.
q 5289	Milk, ...	Frederick Tracy, Shirley, Mass., ...	Total solids, 11.10 per cent.; fat, 3.20 per cent.; contained added water.
q 5290			Total solids, 11.22 per cent.; fat, 4.00 per cent.; contained added water.
12662	Milk, ...	Manuel F. Simons, Somerset, Mass., . . .	Total solids, 10.64 per cent.; fat, 3.30 per cent.; contained added water.
12663			Total solids, 10.80 per cent.; fat, 3.40 per cent.; contained added water.
12664			Total solids, 10.60 per cent.; fat, 3.50 per cent.; contained added water.
12665			Total solids, 10.50 per cent.; fat, 3.30 per cent.; contained added water.
12666			Total solids, 10.60 per cent.; fat, 3.30 per cent.; contained added water.
12667			Total solids, 10.64 per cent.; fat, 3.60 per cent.; contained added water.
12668			Total solids, 9.84 per cent.; fat, 3.40 per cent.; contained added water.
12669			Total solids, 9.63 per cent.; fat, 3.40 per cent.; contained added water.
12670			Total solids, 9.93 per cent.; fat, 3.40 per cent.; contained added water.

12671	Milk, ...	Manuel F. Simons, Somerset, Mass., ...	Total solids, 10.28 per cent.; fat, 3.40 per cent.; contained added water.
q 5297	Milk, ...	Josephine King, Dedham, Mass., ...	Total solids, 10.25 per cent.; fat, 3.20 per cent.; contained added water.
q 5298			Total solids, 10.20 per cent.; fat, 3.30 per cent.; contained added water.
q 5299			Total solids, 10.80 per cent.; fat, 3.70 per cent.; contained added water.
q 5300			Total solids, 10.09 per cent.; fat, 3.10 per cent.; contained added water.
q 5301			Total solids, 11.46 per cent.; fat, 3.80 per cent.; contained added water.
q 5302			Total solids, 12.28 per cent.; fat, 3.90 per cent.; contained added water.
q 5303			Total solids, 10.57 per cent.; fat, 3.30 per cent.; contained added water.
5816 N	Milk, ...	Frank A. Perry, Westport, Mass., ...	Total solids, 11.70 per cent.; fat, 4.20 per cent.; contained added water.
5820 N			Total solids, 12.60 per cent.; fat, 4.60 per cent.; contained added water.
5822 N			Total solids, 11.20 per cent.; fat, 3.25 per cent.; contained added water.
5828 N			Total solids, 11.80 per cent.; fat, 3.95 per cent.; contained added water.
4973 R	Milk, ...	Alec Bucci, Melrose, Mass., ...	Total solids, 11.40 per cent.; fat, 3.40 per cent.; contained added water.
4795 R	Milk, ...	Edward A. Butters, Bedford, Mass., ...	Total solids, 10.80 per cent.; fat, 2.30 per cent.; contained added water. Proteids, 3.38 per cent.; skimmed milk.

INSPECTION OF DAIRIES.

During the month of July, 1910, 71 dairies were examined in the following places: —

Place.	Number examined.	Number found to present no Objectionable Features.	Per Cent.	Number concerning which Letters were sent.	Per Cent.
Duxbury,	–	–	–	–	–
Third inspection,	1	1	100.00	–	–
Grafton,	10	6	60.00	4	40.00
Second inspection,	26	17	65.38	9	34.62
Third inspection,	3	1	33.33	2	66.67
Kingston,	3	2	66.67	1	33.33
Second inspection,	18	14	77.78	4	22.22
Millbury,	–	–	–	–	–
Second inspection,	1	1	100.00	–	–
Plympton,	–	–	–	–	–
Second inspection,	9	9	100.00	–	–

Total number of dairies examined,	71
Number found to be free from objectionable conditions,	51
Number concerning which letters were sent,	20
Total number of conditions to which attention was called,	60
Percentage of dairies which passed inspection,	71.83

In addition to the above, 15 dairies were visited at which the sale of milk has been discontinued.

The names of the owners of the dairies found to be worthy of commendation follow: —

Duxbury.

Class A.

Bay Farm Co.‡

Grafton.

Class A.

Burton, Smith
Jourdan Alfred
Nelson, estate of A. B.*†

Class B.

Adams, Joseph *
Brooks, G. B.*
Estabrook, Edward A.‡
Gannon, M.*
Goddard, Perley*
Grafton Town Farm *†
Hanson, J.*†
Johnson, Mrs. A.*
Lincoln, D. E.*
Lingley, C. W.*
Olsen, John *
Parker, E. S.
Prescott, F.
Robbins, George W.*†
Stowe, L. A.*
Sumner, Edward
Taylor, J. L.*†
Tobin, John
Worcester, J. C.*
Young, G. P.*
Young, H. P.*

* Second inspection. † Reported favorably on first inspection. ‡ Third inspection.

KINGSTON.

Class A.

Holmes, Miss Helen *†

Class B.

Adams, Horatio *†
Ayer, Eugene *†
Bailey, Elsworth
Cook, Henry *
Delano, Paul
Faunce, Walter *†
Hernandez, Jose *
Holmes, Horace *†
Holmes, Joseph A.*†
Keene, Francis *†
Lane, estate of George F.*†
Monks, John *†
Padelford, Enoch *†
Quinn, John *
Reidenbach, S.*†

MILLBURY.

Class B.

Cross, W. H.*†

PLYMPTON.

Class B.

Barnaby, S. H.*†
Blanchard, F. W.*
Churchill, D. E.*†
Dennett, F. W.*†
Greene, T. W.*
Hammond, Dr. William P.*†
Perkins, Charles *
Seymour, R. W.*†
Thomas, George *

---

* Second inspection. † Reported favorably on first inspection.

OUTBREAK OF SCARLET FEVER IN AND ABOUT BOSTON DURING APRIL AND MAY, 1910.

During the last week in April and the first week in May an outbreak of scarlet fever occurred in Boston and suburbs.

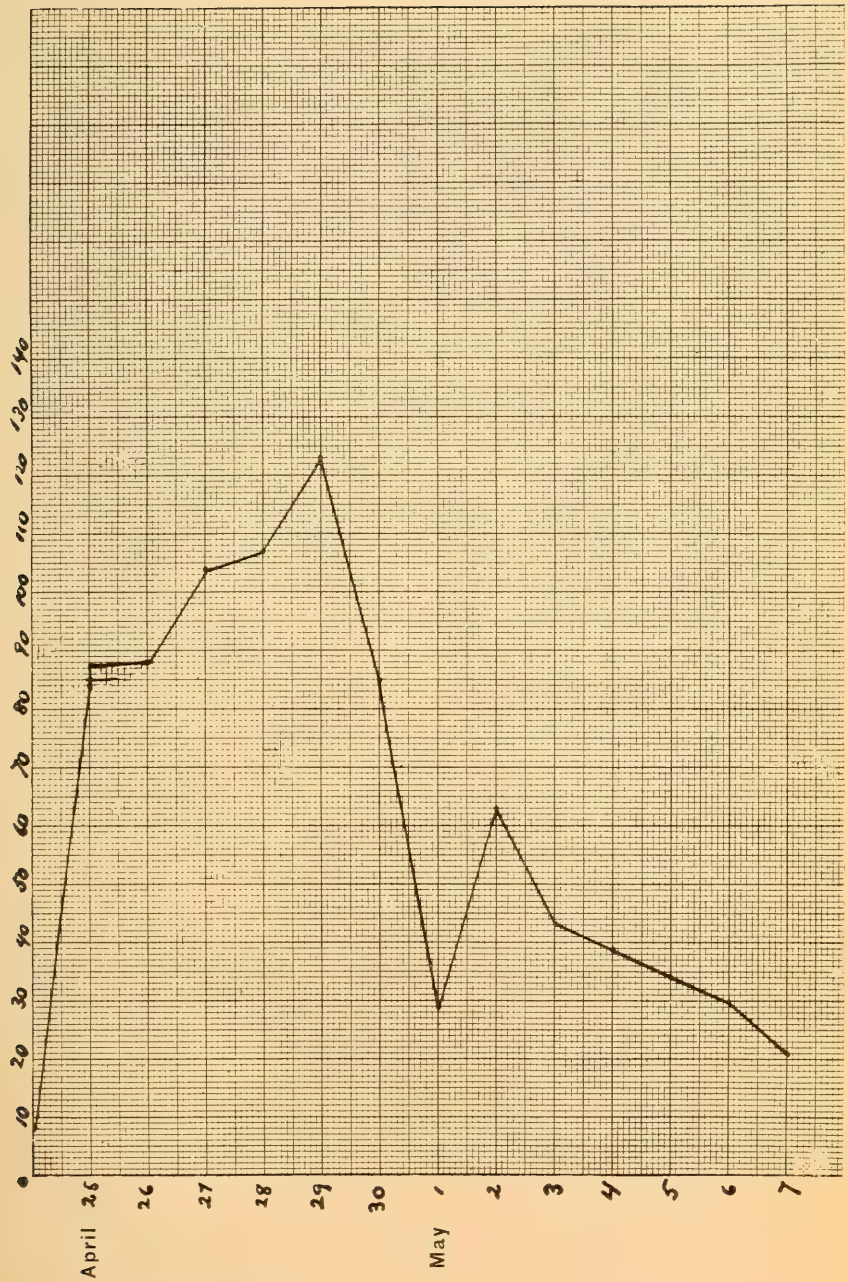
The following table shows the incidence of the cases as they were reported to the boards of health of the various cities between April 25 and May 7. The accompanying chart shows the total daily incidence of cases in all the cities where the outbreak occurred. The sudden drop of the cases on May 1 is due to the fact that it was Sunday, and, with the exception of Boston and Chelsea, no cases were reported to the boards of health.

Location.	April.						May.							Total.
	25	26	27	28	29	30	1	2	3	4	5	6	7	
Boston,	23	36	35	56	70	44	26	26	26	10	21	15	13	401
Chelsea,	3	2	1	2	10	5	–	6	4	2	3	3	4	45
Winthrop,	1	1	8	1	2	1	3	–	–	1	–	–	–	18
Cambridge,	18	11	27	10	21	14	–	9	5	7	5	3	3	133
Somerville,	18	18	16	25	10	15	–	14	5	5	–	5	3	134
Malden,	14	13	15	5	6	3	–	3	3	4	1	3	1	71
Everett,	11	7	2	8	4	3	–	2	–	–	1	1	1	40
Totals,	88	88	104	107	123	85	29	60	43	29	31	30	25	842

This sudden outbreak of scarlet fever so widely distributed, at a time of the year when no unusual number of cases generally occurs, pointed to a common source of infection. Investigation showed that most of the cases occurred on the route of a large milk contractor, who distributed milk in Boston and suburbs.

Of 409 cases in Boston, 286, or nearly 70 per cent., were on the route of this dealer, while 123, or 30 per cent., used other milk. Of the 155 cases that occurred in Cambridge (including 22 cases that occurred between May 7 and 14), 126, or over 80 per cent., were on the route of the same dealer. About the same proportion of the cases in the other cities used the milk of this dealer.

The earliest reports to the Boston board of health directed suspicion to this milk supply. Of the 23 cases reported on April 25, 16 were on the route of this large milk contractor, and immediate steps were taken



Daily incidence of cases of scarlet fever in and about Boston from April 25 to May 7, 1910.

by the Boston board of health to render the suspected supply safe by pasteurization.

From the dates of the first symptoms of the early cases the first infection probably took place on April 20 or 21. An examination of the chart shows that the epidemic reached its highest mark on April 29, when 123 cases were reported, which would indicate that the outbreak was the result of more than a single infection.

There were certain circumstances connected with this outbreak which showed that the milk was infected as late as April 23. These circumstances were as follows: the week of April 24 was the Jewish Passover, during which festival only milk from a specially guarded supply, complying with certain requirements in the matter of handling utensils, cans, etc., is permitted. The contractor in question undertook to furnish milk complying with these requirements. It thus happened that a number of Jewish families, who previous to April 24 used other milk, began to use the milk of this special supply on April 24. On April 26 a Jewish child became sick with scarlet fever in a family who began to use the milk in question on April 24. Altogether there were 73 cases in Boston who used milk from this special supply. Of this number, 24 used other milk previous to April 24.

This special circumstance also pointed to the farms on which the milk was in all probability infected. The contractor gets the milk from some 250 dairies, all the milk being mixed at the central station. Eight dairies were set aside to furnish milk to the special supply. This special milk was handled separately and was not mixed with the general supply. Three of these 8 dairies entered in the general family supply previous to April 23. The milk from these 3 dairies was therefore common to the general family supply up to April 23, and to the special supply after that date; and since the infection occurred in both supplies, and as there appeared no possible source of infection at the central station, it would seem that the milk must have been infected on one of these three farms. A careful examination of these farms, however, failed to reveal any source of infection. On one farm it was learned that at the time of the outbreak one cow in the herd had some disease of the udder. Unfortunately, the cow was sent to be killed shortly before the inspection, so that the nature of the disease could not be determined.

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Approved by
The State Board of Publication.

WEEKLY RETURNS OF DEATHS FROM CITIES AND TOWNS OF MORE THAN 10,000 POPULATION.

WEEK ENDING AUG 6, 1910.

CITIES AND TOWNS.	Population.[1] Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	195	82	99	11	18	1	–	1
Worcester,	136,476	49	21	12	1	3	1	–	–
Fall River,	106,486	51	36	36	4	5	–	1	–
Cambridge,	102,112	35	15	22	2	6	–	–	1
Lowell,	96,380	36	25	25	3	3	–	–	–
New Bedford,	85,516	41	29	28	2	1	–	–	–
Lynn,	84,623	18	7	3	–	2	1	–	–
Springfield,	84,237	32	15	9	1	–	–	–	–
Lawrence,	78,000	32	21	19	2	2	–	–	–
Somerville,	76,049	17	9	15	2	2	1	–	–
Brockton,	55,039	7	3	1	–	–	–	1	–
Holyoke,	53,590	27	16	12	–	2	1	–	–
Malden,	41,941	10	5	4	–	–	–	–	–
Chelsea,	40,080	14	4	1	–	1	–	–	–
Newton,	39,642	6	2	–	–	–	–	–	–
Salem,	39,019	8	–	4	1	–	–	–	–
Haverhill,	38,362	10	5	4	1	–	–	–	1
Fitchburg,	34,263	11	6	3	–	1	1	–	–
Everett,	33,597	9	4	1	–	1	–	–	–
Quincy,	31,937	14	6	3	1	–	–	–	–
Taunton,	30,967	23	16	16	2	–	–	1	–
Waltham,	28,761	8	1	2	1	–	–	–	–
Pittsfield,	27,932	15	8	8	–	–	–	–	–
Brookline,	26,674	3	–	–	–	–	–	–	–
Gloucester,	26,011	5	1	1	–	–	–	–	–
North Adams,	22,150	7	5	3	–	–	–	–	1
Northampton,	21,075	8	1	2	–	1	–	–	–
Chicopee,	21,049	13	8	6	2	1	–	–	–
Medford,	20,921	6	1	2	1	1	–	–	–
Beverly,	16,386	6	3	2	–	–	–	–	–
Leominster,	16,030	5	1	1	–	1	–	–	–
Hyde Park,	15,609	2	–	–	–	–	–	–	–
Melrose,	15,459	1	0	–	–	–	–	–	–
Newburyport,	14,834	3	2	–	–	–	–	–	–
Revere,	14,820	4	3	1	–	1	–	–	–
Westfield,	14,750	12	3	5	–	5	–	–	–
Woburn,	14,522	4	2	2	1	–	1	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	4	1	2	–	–	–	–	–
Attleborough,	13,913	6	5	5	–	–	–	–	–
Adams,	13,685	7	6	5	–	–	–	–	–
Clinton,	13,105	1	–	–	–	–	–	–	–
Gardner,	13,066	6	5	5	1	–	–	–	1
Milford,	12,722	8	6	5	–	–	–	–	–
Watertown,	12,676	8	4	3	1	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	2	1	1	–	–	–	–	–
Weymouth,	11,798	2	–	–	–	–	–	–	–
Framingham,	11,749	3	0	1	–	1	–	–	–
Wakefield,	11,124	–	–	–	–	–	–	–	–
Webster,	11,109	5	3	2	–	–	–	–	–
Arlington,	10,520	4	–	–	–	–	–	–	–
Greenfield,	10,140	2	1	2	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,390,577	805	398	383	40	58	7	3	5

[1] The populations were estimated upon the rate of growth from 1900 to 1905. Those of Taunton, Gloucester, North Adams and Clinton were allowed to stand as in 1905, having shown no increase during the five-year period. The gain in the population of Lowell is due to the annexation of a part of the town of Tewksbury. The population of Lawrence by the census of 1905 was 70,050, but, owing to the building of the new Wood and Arlington mills, an increase of about 8,000 is estimated by the Lawrence Board of Health, or 78,000.

WEEK ENDING AUG. 13, 1910.

CITIES AND TOWNS.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	190	87	81	8	13	2	1	1
Worcester,	136,476	53	19	11	2	5	–	–	–
Fall River,	106,486	51	32	31	3	6	–	–	–
Cambridge,	102,112	24	7	9	1	3	–	–	–
Lowell,	96,380	33	14	17	3	2	–	–	–
New Bedford,	85,516	32	18	18	–	3	–	–	–
Lynn,	84,623	17	8	2	–	1	–	1	–
Springfield,	84,237	27	14	10	1	1	–	–	–
Lawrence,	78,000	41	25	23	3	2	–	–	–
Somerville,	76,049	17	5	4	1	–	–	–	–
Brockton,	55,039	17	4	8	–	4	–	–	–
Holyoke,	53,590	27	18	13	1	–	–	–	–
Malden,	41,941	15	2	3	–	1	–	–	–
Chelsea,	40,080	9	3	–	–	–	–	–	–
Newton,	39,642	6	2	–	–	–	–	–	–
Salem,	39,019	13	–	–	–	–	–	–	–
Haverhill,	38,362	17	1	4	–	1	–	–	–
Fitchburg,	34,263	8	2	2	–	–	–	2	–
Everett,	33,597	2	–	–	–	–	–	–	–
Quincy,	31,937	3	1	1	–	–	–	–	–
Taunton,	30,967	15	9	8	–	1	–	–	–
Waltham,	28,761	3	1	–	–	–	–	–	–
Pittsfield,	27,932	11	4	5	1	1	–	–	–
Brookline,	26,674	5	1	–	–	–	–	–	–
Gloucester,	26,011	7	–	2	–	1	–	–	–
North Adams,	22,150	8	4	4	–	1	–	–	–
Northampton,	21,075	9	1	5	1	2	–	–	–
Chicopee,	21,049	10	9	5	1	–	–	–	–
Medford,	20,921	3	1	1	1	–	–	–	–
Beverly,	16,386	1	–	–	–	–	–	–	–
Leominster,	16,030	1	–	1	–	–	–	1	–
Hyde Park,	15,609	7	2	3	–	1	–	1	–
Melrose,	15,459	4	3	3	–	–	–	–	–
Newburyport,	14,834	1	–	–	–	–	–	–	–
Revere,	14,820	5	3	4	1	–	–	–	–
Westfield,	14,750	11	4	3	1	2	–	–	–
Woburn,	14,522	3	2	3	–	–	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	7	1	–	–	–	–	–	–
Attleborough,	13,913	7	5	1	1	–	–	–	–
Adams,	13,685	5	4	2	–	–	–	–	–
Clinton,	13,105	4	1	–	–	–	–	–	–
Gardner,	13,066	2	2	2	–	–	–	–	–
Milford,	12,722	4	2	2	–	–	–	–	–
Watertown,	12,676	–	–	–	–	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	5	4	3	–	–	–	–	–
Weymouth,	11,798	2	1	–	–	–	–	–	–
Framingham,	11,749	1	0	–	–	–	–	–	–
Wakefield,	11,124	–	–	–	–	–	–	–	–
Webster,	11,109	2	1	–	–	–	–	–	–
Arlington,	10,520	1	–	–	–	–	–	–	–
Greenfield,	10,140	2	–	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,377,901	748	327	294	30	51	2	6	1

WEEK ENDING AUG. 20, 1910.

CITIES AND TOWNS.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	232	78	86	19	17	1	3	2
Worcester,	136,476	49	16	9	2	4	–	–	–
Fall River,	106,486	53	32	25	6	2	–	–	–
Cambridge,	102,112	27	6	10	2	3	–	–	–
Lowell,	96,380	40	15	10	2	6	–	–	–
New Bedford,	85,516	40	19	15	1	–	–	–	–
Lynn,	84,623	24	7	–	–	–	–	–	–
Springfield,	84,237	30	16	13	3	3	–	–	–
Lawrence,	78,000	40	26	19	3	2	–	–	–
Somerville,	76,049	18	4	5	1	1	–	–	–
Brockton,	55,039	13	4	6	1	1	–	1	–
Holyoke,	53,590	19	11	12	1	1	–	–	–
Malden,	41,941	16	8	5	–	–	–	–	–
Chelsea,	40,080	7	1	2	1	1	–	–	–
Newton,	39,642	10	4	1	–	1	–	–	–
Salem,	39,019	14	5	–	–	–	–	–	–
Haverhill,	38,362	22	10	4	–	–	–	–	–
Fitchburg,	34,263	4	1	1	–	1	–	–	–
Everett,	33,597	7	2	5	–	2	–	–	–
Quincy,	31,937	14	8	4	–	–	–	–	–
Taunton,	30,967	24	18	15	–	–	–	–	–
Waltham,	28,761	6	4	–	–	–	–	–	–
Pittsfield,	27,932	9	3	3	–	–	–	1	–
Brookline,	26,674	7	1	–	–	–	–	–	–
Gloucester,	26,011	8	2	2	–	1	1	–	–
North Adams,	22,150	9	3	3	–	1	–	1	–
Northampton,	21,075	3	1	–	–	–	–	–	–
Chicopee,	21,049	13	9	6	1	–	–	–	–
Medford,	20,921	5	4	1	–	–	–	–	–
Beverly,	16,386	4	3	3	–	–	–	–	–
Leominster,	16,030	4	1	1	–	1	–	–	–
Hyde Park,	15,609	4	2	2	–	–	–	–	–
Melrose,	15,459	6	1	1	–	1	–	–	–
Newburyport,	14,834	2	–	–	–	–	–	–	–
Revere,	14,820	1	1	–	–	–	–	–	–
Westfield,	14,750	9	2	2	–	1	–	1	–
Woburn,	14,522	7	1	5	–	2	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	6	1	2	–	–	–	1	–
Attleborough,	13,913	5	4	4	–	–	–	–	–
Adams,	13,685	5	2	–	–	–	–	–	–
Clinton,	13,105	3	1	2	–	1	–	–	–
Gardner,	13,066	6	2	2	–	–	–	–	–
Milford,	12,722	4	2	1	–	–	–	–	–
Watertown,	12,676	3	1	1	–	1	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	4	3	2	–	–	–	–	–
Weymouth,	11,798	–	–	–	–	–	–	–	–
Framingham,	11,749	6	1	1	–	–	–	–	–
Wakefield,	11,124	–	–	–	–	–	–	–	–
Webster,	11,109	5	2	2	–	–	–	–	–
Arlington,	10,520	3	2	–	–	–	–	–	–
Greenfield,	10,140	0	–	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,378,779	850	350	293	43	54	2	8	3

WEEK ENDING AUG. 27, 1910.

CITIES AND TOWNS.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	221	72	87	12	24	4	3	3
Worcester,	136,476	34	19	5	1	1	1	1	–
Fall River,	106,486	45	29	27	2	1	1	–	–
Cambridge,	102,112	24	8	9	3	3	–	–	–
Lowell,	96,380	40	23	14	4	4	–	–	–
New Bedford,	85,516	38	18	17	5	1	–	–	–
Lynn,	84,623	28	13	3	1	2	–	–	–
Springfield,	84,237	20	8	8	–	1	1	–	–
Lawrence,	78,000	30	19	21	1	5	1	1	–
Somerville,	76,049	12	6	5	–	1	–	–	1
Brockton,	55,039	19	7	5	–	1	–	1	–
Holyoke,	53,590	26	12	8	–	1	–	–	–
Malden,	41,941	11	3	4	1	1	–	–	–
Chelsea,	40,080	5	1	1	1	–	–	–	–
Newton,	39,642	14	3	2	–	1	–	1	–
Salem,	39,019	15	4	3	–	3	–	–	–
Haverhill,	38,362	16	4	3	–	1	–	–	–
Fitchburg,	34,263	14	6	3	–	–	2	1	–
Everett,	33,597	7	2	–	–	–	–	–	–
Quincy,	31,937	11	7	3	–	–	–	–	–
Taunton,	30,967	17	8	11	1	–	–	–	–
Waltham,	28,761	7	4	–	–	–	–	–	–
Pittsfield,	27,932	9	1	4	2	2	–	–	–
Brookline,	26,674	4	–	–	–	–	–	–	–
Gloucester,	26,011	8	2	–	–	–	–	–	–
North Adams,	22,150	2	–	–	–	–	–	–	–
Northampton,	21,075	4	1	1	–	–	–	–	–
Chicopee,	21,049	5	3	2	–	–	–	–	–
Medford,	20,921	3	–	1	–	1	–	–	–
Beverly,	16,386	5	1	2	–	–	–	–	–
Leominster,	16,030	6	5	–	–	–	–	–	–
Hyde Park,	15,609	7	4	1	–	–	–	–	–
Melrose,	15,459	0	–	–	–	–	–	–	–
Newburyport,	14,834	2	1	–	–	–	–	–	–
Revere,	14,820	6	3	–	–	–	–	–	–
Westfield,	14,750	6	1	2	–	2	–	–	–
Woburn,	14,522	6	1	2	–	–	–	1	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	2	1	–	–	–	–	–	–
Attleborough,	13,913	2	–	–	–	–	–	–	–
Adams,	13,685	7	3	3	–	–	–	–	–
Clinton,	13,105	4	1	1	1	–	–	–	–
Gardner,	13,066	5	1	1	–	–	–	–	–
Milford,	12,722	4	3	4	–	–	–	–	–
Watertown,	12,676	3	1	1	1	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	9	6	6	–	–	–	1	–
Weymouth,	11,798	5	1	1	–	1	–	–	–
Framingham,	11,749	4	0	–	–	–	–	–	–
Wakefield,	11,124	–	–	–	–	–	–	–	–
Webster,	11,109	3	1	2	–	–	–	–	–
Arlington,	10,520	–	–	–	–	–	–	–	–
Greenfield,	10,140	4	2	1	1	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,380,057	779	319	274	37	57	10	10	4

WEEKLY RETURNS OF DEATHS FROM CERTAIN INFECTIOUS DISEASES.

DEATHS FROM INFECTIOUS DISEASES NOT SPECIFICALLY MENTIONED IN ABOVE TABLES DURING THE WEEKS OF AUG. 6, 13, 20 AND 27, 1910.

DISEASE.	Place.	WEEK ENDING—			
		Aug. 6.	Aug. 13.	Aug. 20.	Aug. 27.
Cerebro-spinal meningitis,	Brockton,	–	–	1	2
	Haverhill,	–	–	1	1
	Holyoke,	–	–	1	–
	Malden,	–	–	1	–
	North Adams,	–	1	–	–
	Worcester,	1	–	–	–
Scarlet fever,	Adams,	1	–	–	–
	Boston,	1	2	–	2
	Fitchburg,	1	–	–	–
	Lowell,	1	1	–	–
	Malden,	–	1	–	–
Whooping cough,	Adams,	1	–	–	–
	Boston,	–	1	1	–
	Fall River,	2	–	–	1
	Haverhill,	1	1	–	–
	Lawrence,	1	–	–	–
	Melrose,	–	1	–	–
	Pittsfield,	1	–	–	–
	Revere,	–	2	–	–
	Springfield,	–	1	–	–
	Webster,	1	–	–	–
	Worcester,	–	1	–	–
Erysipelas,	Lawrence,	–	1	–	–
	Milford,	–	–	–	1
	Northampton,	–	1	–	–
Tuberculosis, other than pulmonary.	Beverly,	1	–	–	–
	Boston,	5	3	7	3
	Brockton,	–	2	–	–
	Cambridge,	1	–	1	–
	Chicopee,	–	–	1	1
	Fall River,	1	1	1	–
	Gardner,	–	–	1	–
	Greenfield,	1	–	–	–
	Gloucester,	1	1	–	–
	Holyoke,	–	2	1	–
	Lawrence,	2	–	2	–
	Malden,	–	–	–	1
	Medford,	–	–	1	–
	Salem,	2	–	–	–
	Springfield,	–	–	–	1
	Worcester,	1	–	3	–

DEATHS FROM INFECTIOUS DISEASES, ETC. — *Concluded.*

DISEASE.	Place.	WEEK ENDING — Aug. 6.	Aug. 13.	Aug. 20.	Aug. 27.
Meningitis other than cerebro-spinal.	Everett,	–	–	1	–
	Watertown,	1	–	–	–
Anterior poliomyelitis,	Chicopee,	1	–	–	–
	Fall River,	–	–	1	–
	Springfield,	–	1	1	1
	Taunton,	–	–	–	1

WEEKLY RETURNS OF CASES OF INFECTIOUS DISEASES.

CASES OF INFECTIOUS DISEASES REPORTED DURING THE WEEKS OF AUG. 6, 13, 20 AND 27, 1910.

[Under the provisions of section 52 of chapter 75 of the Revised Laws.]

	WEEK ENDING — Aug. 6.	Aug. 13.	Aug. 20.	Aug. 27.	Total.
Diphtheria,	86	97	100	94	377
Measles,	84	41	40	39	204
Scarlet fever,	58	61	57	48	224
Typhoid fever,	119	193	227	189	728
Tuberculosis, pulmonary,	133	161	131	118	543
Tuberculosis other than pulmonary,	–	1	–	2	3
Cerebro-spinal meningitis,	3	4	5	2	14
Meningitis other than cerebro-spinal,	1	1	2	–	4
Whooping cough,	56	24	31	20	131
Varicella,	17	3	4	6	30
Erysipelas,[1]	1	–	–	1	2
Mumps,[1]	5	–	4	2	11
Ophthalmia neonatorum,	3	4	9	3	19
Anterior poliomyelitis,	38	40	32	30	140
Tetanus,	–	1	2	–	3
Actinomycosis,	–	1	–	–	1
Malaria,	–	1	1	–	2
Trachoma,	–	1	–	–	1
Glanders,	–	–	–	1	1
Anthrax,	1	1	–	–	2
Aggregate,					2,440

[1] Erysipelas and mumps are not diseases notifiable under section 52 of chapter 75 of the Revised Laws. The figures concerning these diseases are, therefore, incomplete.

MONTHLY REPORT ON INSPECTION OF FOOD AND DRUGS.

The following summary presents the results of the examination of food and drugs made by the State Board of Health during the month of August, 1910: —

Articles examined.	Number found to be of Good Quality.	Number adulterated or varying from the Legal Standard.	Total.	Articles examined.	Number found to be of Good Quality.	Number adulterated or varying from the Legal Standard.	Total.
Butter,	1	–	1	Malt liquor,	1	–	1
Canned fruit,	2	–	2	Meat products: —			
Canned fish,	3	–	3	Beef steak,[1]	1	–	1
Cocoa,	1	–	1	Milk,	357	116	473
Cream,	3	–	3	Olive oil,	4	2	6
Drugs,	52	11	63	Ice-cream cones,	8	–	8
Extract of lemon,	1	–	1	Salad dressing,	1	–	1
Extract of vanilla,	1	–	1	Sugar,	1	–	1
Fruit juice, orange,	1	–	1	Spices,	2	–	2
Fruit juice, pine apple,	1	–	1	Table sauce,	1	–	1
Honey,	1	–	1	Vinegar,	4	2	6
Jams and jellies,	4	–	4	Total,	451	131	582

[1] Examined for horse meat; negative result.

The samples of drugs found to be adulterated were: alcohol, fluid extract of ginger, camphor liniment, methyl alcohol, turpentine, precipitated sulphur, tincture iodine and a proprietary medicine.

The cities and towns in which samples were collected were: Andover, Arlington, Attleborough, Bedford, Beverly, Billerica, Boston, Brookline, Blackstone, Cambridge, Chelsea, Dedham, Falmouth, Fall River, Fitchburg, Hingham, Lowell, Lunenburg, Malden, Maynard, Medford, Melrose, Nahant, Nantucket, Natick, Northbridge, Northampton, Oak Bluffs, Rutland, Salem, Vineyard Haven, Wakefield, Waltham, Weymouth, Wellesley, Woods Hole, Wilmington, Williamstown and Worcester.

PROSECUTIONS FOR VIOLATIONS OF THE LAW RELATING TO FOOD AND DRUGS.

Fifteen convictions were secured during the month of August, 1910, for selling adulterated food and drugs, as follows: —

No.	Name of Defendant.	Place.	Character of Article sold.
1	Quinlan Leary,	Fall River,	Alcohol (86.36 per cent. U. S. P.).
2	John F. Murphy,	Fall River,	Alcohol (79.23 per cent. U. S. P.).
3	Arthur Burnside (Markel Drug Co.),	Boston,	Camphor liniment (0.65 per cent. U. S. P.).
4	Herbert F. Veeder (Choate Drug and Chem. Co.),	Boston,	Camphor liniment (0.75 per cent. U. S. P.).
5	Alexander Bucci,	Melrose,	Milk (total solids, 11.40).
6	Joseph Chenelle,	Lowell,	Milk (total solids, 11.00).[1]
7	Winthrop H. Farnsworth,	Waltham,	Milk (total solids, 8.97).[2]
8	Stephen Havey,	Hingham,	Milk (total solids, 10.59).[1]
9	Josephine Krug,	Dedham,	Milk (total solids, 10.09).[1]
10	Vener H. Paquette,	Swansea,	Milk (total solids, 10.24).[1]
11	Frank A. Perry,	Westport,	Milk (total solids, 11.20).[1]
12	Charles M. Schultz,	Norfolk,	Milk (total solids, 10.20).[1]
13	Manuel Simons,	Somerset,	Milk (total solids, 9.63).[1]
14	Morris Wineapple,	Salem,	Milk (total solids, 9.60).[1]
15	Arthur Burnside,	Boston,	Tincture iodine (0.75 per cent. U. S. P.).

[1] Watered. [2] Skimmed.

Fines imposed, $500.

LIST OF ADULTERATED OR IMPROPERLY LABELED FOODS, ETC., FOR AUGUST, 1910.

Number of Sample.	Character of Sample.	Name of Manufacturer, Wholesaler or Producer.	Results of Analysis.
5321 R	Olive oil,	"La Famosa Brand,"	Mixture of cotton-seed and olive oils; percentage of ingredients not stated.
5325 R	Olive oil,	Olio D'Oliva Sopraffino, F. Ferucci Lucca, Toscana, Italy,	Contained cotton-seed oil.
12693	Fairbank's Rock Cordial Rye.	E. L. Monroe Co., Boston, Mass.,	Contained 24 per cent. alcohol.
6066 N	Camphorated oil,	R. G. Coffin & Co., Nantucket, Mass.,	20 per cent. U. S. P. strength.
12742	Camphorated oil,	James G. Norton, Oak Bluffs, Mass.,	20 per cent. U. S. P. strength.
6072 N	Fluid extract of ginger,	R. E. Congdon, Nantucket, Mass.,	Water extract; not U. S. P. strength.
6104 N	Tincture of iodine,	Ira B. Case, Columbia Road, Boston,	71 per cent. U. S. P. strength.
5091 R	Milk,	Charles M. Schultz, Norfolk, Mass.,	Total solids, 10.20 per cent.; fat, 2.90 per cent.; contained added water.
5095 R	Milk,	Charles M. Schultz, Norfolk, Mass.,	Total solids, 11.00 per cent.; fat, 3.30 per cent.; contained added water.
q 5421	Milk,	Charles J. Campbell, Rutland, Mass.,	Total solids, 11.64 per cent.; fat, 3.80 per cent.; contained added water.
q 5423	Milk,	Charles J. Campbell, Rutland, Mass.,	Total solids, 10.58 per cent.; fat, 2.70 per cent.; contained added water.
q 5463	Milk,	Winthrop M. Brown, Lunenburg, Mass.,	Total solids, 9.60 per cent.; fat, 2.75 per cent.; contained added water.
q 5464	Milk,	Winthrop M. Brown, Lunenburg, Mass.,	Total solids, 9.86 per cent.; fat, 3.00 per cent.; contained added water.
q 5465	Milk,	Winthrop M. Brown, Lunenburg, Mass.,	Total solids, 11.00 per cent.; fat, 3.45 per cent.; contained added water.
q 5467	Milk,	Winthrop M. Brown, Lunenburg, Mass.,	Total solids, 10.00 per cent.; fat, 2.85 per cent.; contained added water.
q 5468	Milk,	Winthrop M. Brown, Lunenburg, Mass.,	Total solids, 10.26 per cent.; fat, 3.10 per cent.; contained added water.

LIST OF ADULTERATED OR IMPROPERLY LABELED FOODS, ETC. — *Concluded.*

Number of Sample.	Character of Sample.	Name of Manufacturer, Wholesaler or Producer.	Results of Analysis.
q 5469	Milk,	Winthrop M. Brown, Lunenburg, Mass.,	Total solids, 10.70 per cent.; fat, 3.20 per cent.; contained added water.
q 5470	Milk,	Winthrop M. Brown, Lunenburg, Mass.,	Total solids, 9 36 per cent.; fat, 2.70 per cent.; contained added water.
q 5471	Milk,	Winthrop M. Brown, Lunenburg, Mass.,	Total solids, 9.86 per cent.; fat, 2.60 per cent.; contained added water.
5293 R	Milk,	Wollaston Blais, Tiverton, R. I.,	Total solids, 10.70 per cent.; fat, 3.20 per cent.; contained added water.
5994 N	Milk,	Lawrence B. Avery Beverly, Mass.,	Total solids, 11 00 per cent.; fat, 3.25 per cent.; contained added water.

INSPECTION OF DAIRIES.

During the month of August, 1910, 202 dairies were examined in the following places: —

Place.	Number examined.	Number found to present no Objectionable Features.	Per Cent.	Number concerning which Letters were sent.	Per Cent.
Abington,	–	–	–	–	–
Second inspection,	27	22	81.48	5	18.52
Canton,	–	–	–	–	–
Second inspection,	20	13	65.00	7	35.00
Carver,	–	–	–	–	–
Second inspection,	2	2	100.00	–	–
Halifax,	–	–	–	–	–
Second inspection,	11	9	81.82	2	18.18
Hanover,	1	1	100.00	–	–
Second inspection,	12	8	66.67	4	33.33
Hanson,	9	8	88.89	1	11.11
Second inspection,	1	1	100.00	–	–
Middleborough,	10	6	60.00	4	40.00
Second inspection,	22	16	72.73	6	27.27
Milton,	1	1	100.00	–	–
Norwell,	2	–	–	2	100.00
Second inspection,	13	12	92.31	1	7.69
Pembroke,	–	–	–	–	–
Second inspection,	2	2	100.00	–	–
Plymouth,	13	5	38.46	8	61.54
Second inspection,	33	19	57.58	14	42.42
Rockland,	1	–	–	1	100.00
Second inspection,	11	6	54.55	5	45.45
Whitman,	–	–	–	–	–
Second inspection,	11	10	90.91	1	9.09

Total number of dairies examined,	202
Number found to be free from objectionable conditions,	141
Number concerning which letters were sent,	61
Total number of conditions to which attention was called,	184
Percentage of dairies which passed inspection,	69.80

In addition to the above, 52 dairies were visited at which the sale of milk had been discontinued.

The names of the owners of the dairies found to be worthy of commendation follow: —

ABINGTON.

Class A.

Blair, Edward J.*†

* Second inspection. † Reported favorably on first inspection.

Class B.

Arnold, William B.*†
Bates, Frank E.*†
Blanchard, Charles N.*†
Blanchard, George W.*†
Brett, William C.*†
Cushing, Charles E.*†
Cutler, David H.*†
Daniels, Walter H.*†
Dyer, Estate of David D.*†
Ford, Albee A.*†
Fraser, Edward D.*†
Gaffney, Charles B.*†
Howland, Isaac C.*†
Johnson, John *†
Lanstrom, Oscar *
Loud, William T.*†
Peterson, David H.*†
Turfant, Philip P.*†
Turner, George *†
Warren, Frank *†
Williamson, George H.*†

Canton.

Class A.

Crocker, J. B.*†

Class B.

Cushman, Isaac *†
Dalton, James *†
Dean, John H.*†
Draper, Joseph *†
French, C. H.*†
Galligan, M. H.*†
Gerald, F. E.*†
Harding, Charles *†
Hines, D. N. C.*†
May, Henry S.*
Sawyer, L.*†
Willis, Mrs. Joseph *†

Carver.

Class B.

Anthony, Michael *†
Eames, E. H.*†

Halifax.

Class B.

Bosworth, Daniel O.*†
Devitt, Clarence *
Hayward, Estate of George W.*†
Hayward, William C.*†
Ramsdell, Herbert B.*
Tewksbury, C. F.*†
Thompson, Austin S.*†
Thompson, Jabez P.*
Vickery, Mrs. Maria *†

Hanover.

Class B.

Barstow, H. B.*†
Bray, C. A.*†
Callahan, John *†
Church, Samuel *†
Donnell, R. C.*†
Ford Bros.
Jacobs, James *†
Osborne, John *†
Vining, Henry *†

Hanson.

Class A.

Gorham, Dr. A. W.

Class B.

Brewster, H. G.
Hemmenway, D. K.
Hovey, Frank A.
Howland, Calvin *†
Joslyn, Linwood
Kingsbury, Walter E.
Leake, Thomas
Merrill, David M.

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* Second inspection. † Reported favorably on first inspection.

Middleborough.

Class B.

Barrows, Clemmons *†
Boynton, E. P.*†
Braley, Harry *†
Carver, Frank *†
Cheever, Charles
Dean, Orrin F.*
Deane, John *†
Fuller, G. N.
Gibbs, Andrew *
Gibbs, Estate of Moses *
Holmes, Benjamin E.
Johnson, Fred *
Johnson, Thomas *†
Johnson, W. H.
Kelley, Stephen
Cinsman Bros.*†
Mills, Henry S.*†
Miner, R. C.*†
Pratt, L. B.*†
Robinson, Emil
Soule & Dean *†
Wilbur, George *†

Milton.

Class B.

Babcock, Miss E.

Norwell.

Class B.

Burhoff, O. D.*†
Curtis, J. H.*†
Evans, John A.*†
Hammond, L. Frank *
Jones, Frank W.*†
Loring, Benjamin *†
Macomber, C. B.*†
Power, Arthur L.*†
Sampson, Thomas E.*†
Sexton, Edwin M.*†
Thomas, Frank L.*†
Tolman, William C.*†

Pembroke.

Class B.

Ford, A. W.*†
Trinity, S.*†

Plymouth.

Class A.

Whipple, Sherman *†

Class B.

ckford, Joshua *
Burt, George
Caswell, Rufus *†
Finney, J. H.*†
Finney, William H.*
Fish, C. H.*†
Goodwin, Charles
Griffin, Joseph *†
Harlow, Everett *†
Hazen, James W.
Hedges, Barney *†
Howland, Calvin *†
Litchfield, C. I.*†
Madora, Manual *†
Manter, Edward *†
Montanari, Louis *†
Murray, James *†
Proctor, Thomas
Sampson, George N.*†
Taylor, Estate of W. W.*†
Thomas, E.*†
Volter, Vincent
Whiting, Frank *

Rockland.

Class B.

Beal, John W.*
Condon, James *
Poole, H. D.*†
Rudkin, W. J.*†
Sheldon, F. F.*†
Smith, George A.*

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* Second inspection. † Reported favorably on first inspection.

WHITMAN.

Class A.

Churchill, B. F.*†

Class B.

Carleton, E. K.*†
Dyer, C. D.*
Gardner, H. C. & Son *†
Morse, C. L.*†
Prouty, C. S.*†
Sharp, Chester H.*†
Turner, C. W.*†
Vaughan, A. L.*†
White, Edwin *†

PROPRIETARY PREPARATION ADVERTISED AS UNSALABLE IN AUGUST, 1910.

Gauvin's Aniseed Syrup (Sirop D'Anis Gauvin) (J. A. E. Gauvin, Dispensing Chemist, 850 St. Catherine Street, Montreal; Branch, Lowell, Mass.)

DUSTY TRADES IN MASSACHUSETTS.

In April, 1907, an exhibit of industrial conditions was held in Horticultural Hall, Boston, where a large collection of photographs [1] was displayed by the State Board of Health in such a manner as to illustrate conditions from a health point of view in textile and other industries in Massachusetts, as described in a special report of the Board to the Legislature of 1907. These photographs, with others, were exhibited by the State Board of Health at the International Congress on Tuberculosis held in Washington, D. C., from Sept. 21 to Oct. 12, 1908, and Massachusetts was awarded the only medal for work done in this country bearing upon the subject of occupational hygiene.

At the tenth annual meeting of the National Civic Federation, held in New York City, Nov. 22 and 23, 1909, stereopticon views [2] of the following occupations or processes were shown: various processes in the cotton industry; pearl button making; the boot and shoe industry; the horn and celluloid industry; and processes in other industries necessitating the use of emery and buffing wheels and polishing balls.

THE COTTON INDUSTRY.

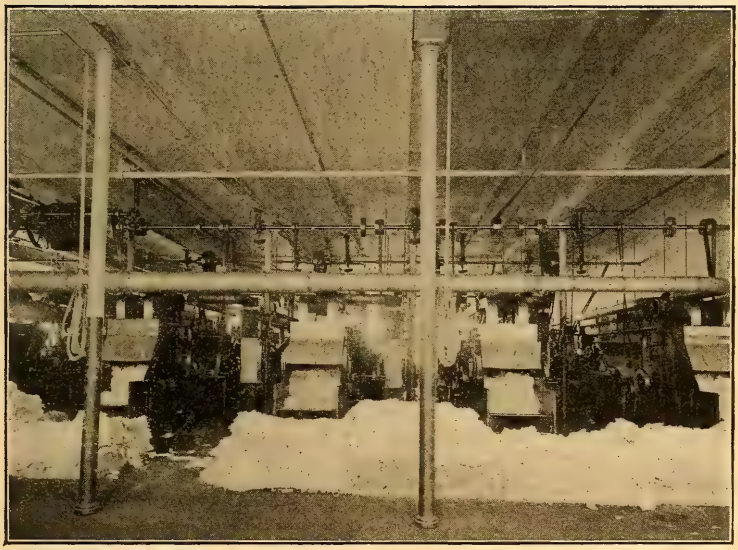
Eight of the first nine pictures show the main processes of manufacture of a high-grade cotton cloth under sanitarily ideal conditions as to light, heat, dust, humidity, gases, etc.

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* Second inspection. † Reported favorably on first inspection.

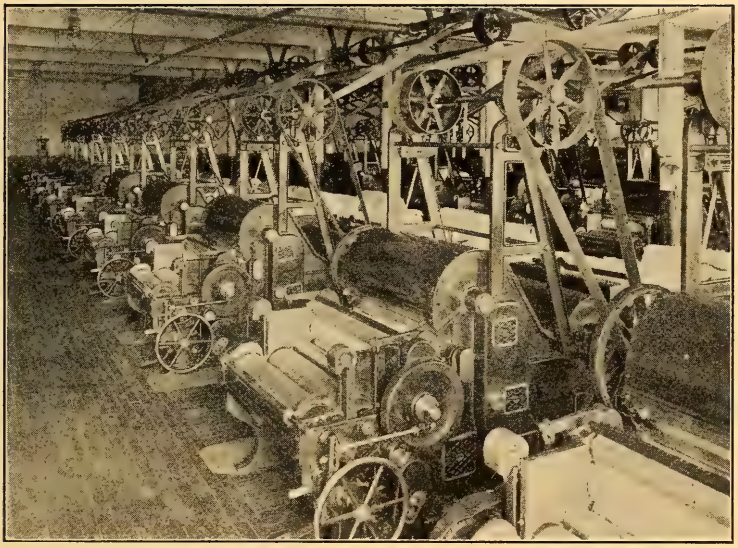
[1] The collection was made possible by the efforts of Mrs. Mary Morton Kehew, Boston, and the photographs were taken under the direction of William C. Hanson, M.D., Cambridge.

[2] The reproductions of photographs shown are reprinted by courtesy of the National Civic Federation.



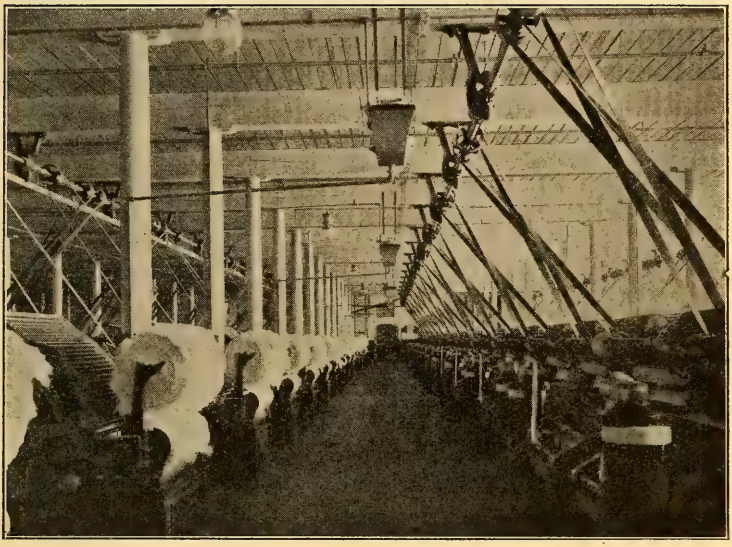
1. Opening Cotton.

The breaker machines are well-equipped with hoods and pipes to carry off the dust. Raw cotton is brought from the storehouse directly into the opening room. Men take the cotton from bales by armfuls, keeping the feed boxes filled.



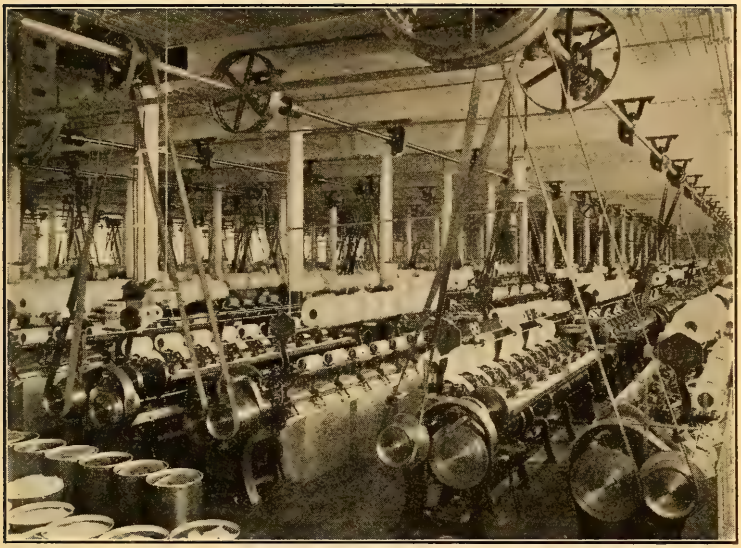
2. Picking.

Heavy machinery mixes the cotton fiber, beats it, cleans it and delivers it in even sheets or layers, known as laps. The employees are men. In spite of the well-constructed modern picker machines, a considerable amount of dust escapes into the workroom. The first picker machine is fed by a "feeder" which holds about 250 pounds of cotton. Usually one man attends five or six of these machines.



3. Carding.

The carding machine further cleans the cotton, and disentangles, straightens and parallelizes the fibers. The employees in the card end of the room are adult men, while those in the other part, on work to be described later, are women. The modern card room is very large and high studded (*e.g.*, 15 feet), with good-sized window glass and transoms which are easily opened. It is well lighted and is heated and ventilated by modern means. In some of the rooms are two or more large exhaust fans. The walls and ceilings are clean and white, and the floor is kept reasonably clean during working hours. The practical questions to be met in the card room are two, namely, (1) how to diminish substantially the amount of dust in the room, and (2) how to ventilate the room properly, both to be accomplished in old mills with reasonable expenditure.



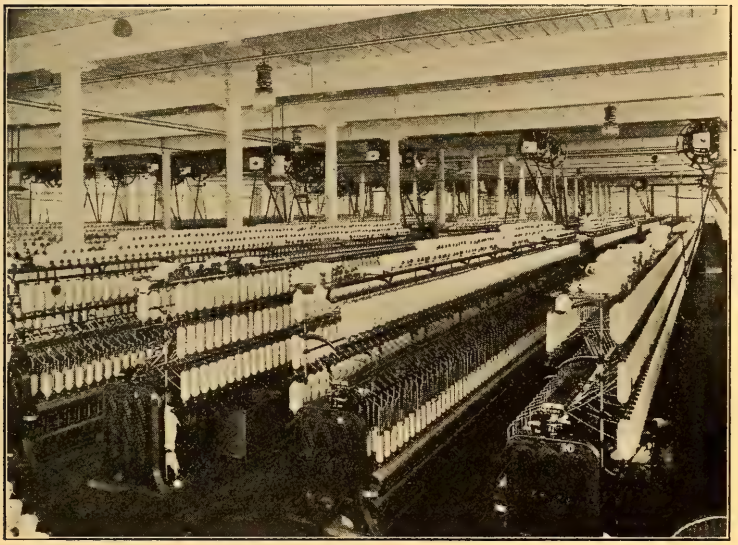
4 Combing.

Combing still further straightens the fiber and perfects the process of carding. The combing process is more satisfactorily followed in a room entirely separate from the carding machines, since the combers are delicate machines, requiring fine adjustment, and the presence of much dust in the air interferes with the work. The employees engaged in the combing department are women. Their duties are to keep the machines supplied with laps, to remove the product, which is in the form of a sliver coiled into cans, and to keep the machines as clean as possible. The work, while not hard, requires constant attention. The women are notified and drilled not to clean the machines when in motion, but, in spite of this discipline, a considerable number of injuries occur. The type of injury is the mutilation or severing of fingers or hands by the series of strips of needles in the combing apparatus. The product is taken by girls or comber tenders to the drawing hands, to be placed through the drawing frames.



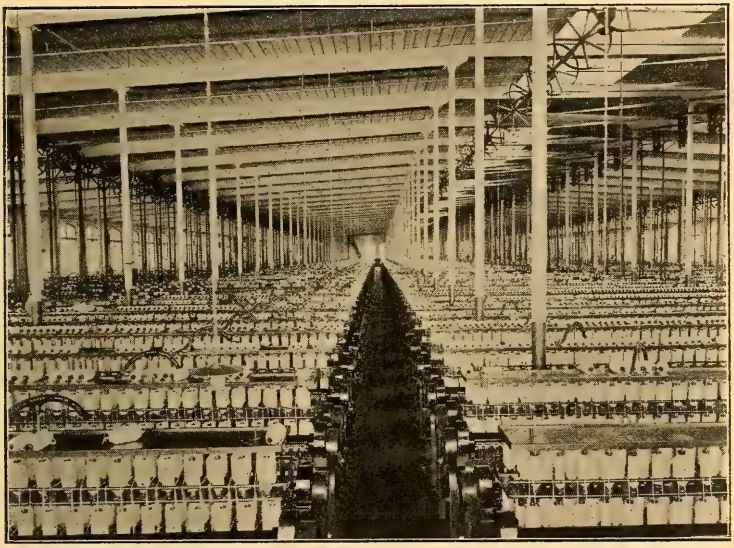
5. Drawing.

Several strands of cotton are drawn into one smaller than any of the others and much more even. The employees are mostly young men.



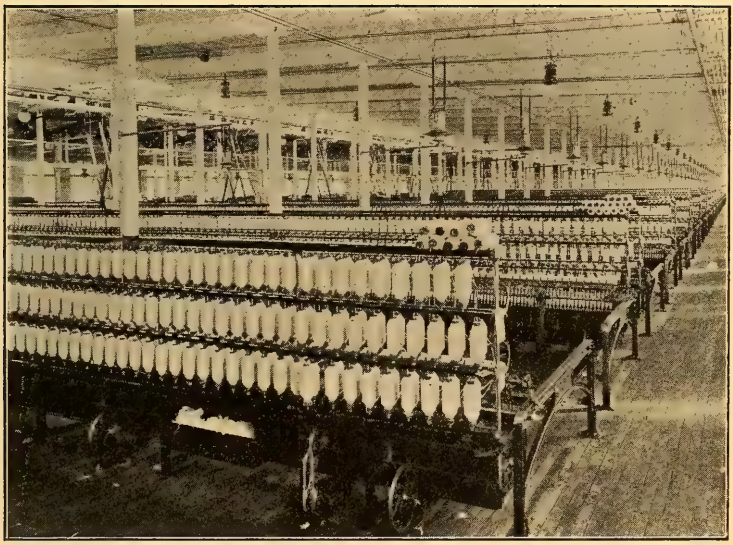
6. Roving.

Roving is an intermediate process between combing and spinning. The sliver of cotton has now become so small that it must be twisted in order to bear handling. The employees are men and women. The work previous to roving is "standing work;" that of the roving processes permits of intervals for sitting. In some mills, special seats are provided for the women employees. Artificial humidity is well regulated in the best mills.



7. Ring Spinning.

The roving now goes to the spinning machine, which may be either a "ring frame" or a "mule." Except for the continuous noise of the machinery, which is very great, but in an uninterrupted, unvarying tone, and for the loose cotton dust in the air of the room, the spinners in a modern, well-regulated ring spinning room work under favorable conditions. Such a room is well ventilated, properly heated, has large windows and transoms which open, clean walls and ceilings, and is lighted by incandescent bulbs. The employees are mostly women, girls and boys.



8 Mule Spinning.

The filling for the cloth may be spun on frames called mules. The employees are men and boys. Because of the high temperature in mule spinning rooms, the men remove their outside clothing and wear undershirts and overalls, while the boys wear short trousers. Commonly, the men and boys go about the room barefooted, although many wear sandals, slippers or old shoes.



9. Weaving.

The employees are men and women. The hygienic essentials among the avoidable conditions are (1) good light evenly distributed, (2) adequate ventilation, (3) proper regulation of heat and moisture.

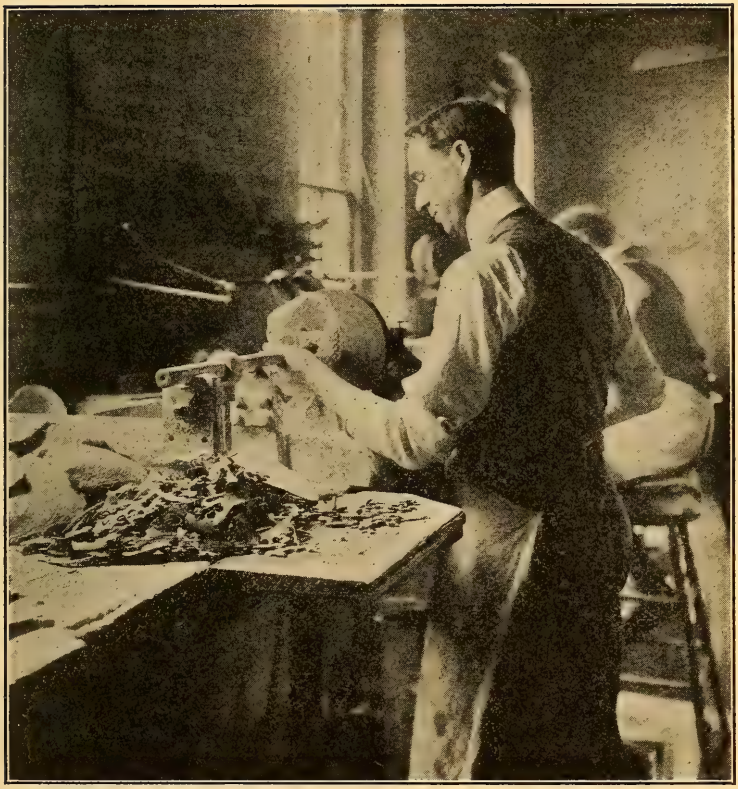
Pearl Button Making.

The next seven pictures show employees at work in the several processes in the pearl industry, and, to a certain extent, show the lack of protection against pearl dust in spite of dust-removing devices.



10. Sawing Pearl Shell.

Although a wet process, the man is exposed to considerable pearl dust. Note the condition of his apron.



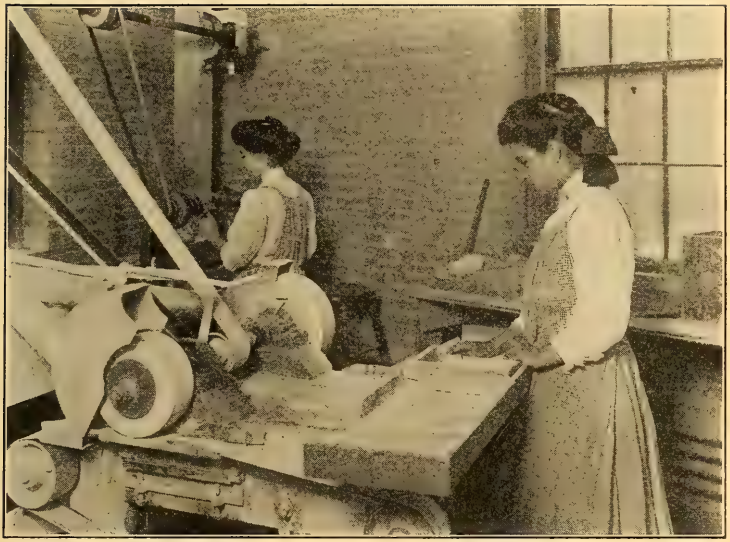
11. Cutting Pearl Shell.

A dry and exceedingly dusty process. The workmen are not in the slightest protected against the pearl (mineral) dust, which causes irritation of the respiratory passages, and may, in the course of time, give rise to symptoms of dust-diseased lungs or of tubercular complication.



12. Boring Pearl Shell.

Note the lack of protective appliances against dust.



13. Planing or Grinding Pearl Disks.

The girl in the foreground is sixteen years of age. She places the disks on a belt which runs beneath the revolving wheel. The girl in the corner is drilling holes in pearl disks. Neither girl is protected against the pearl dust which flies about each. The exhaust system for removing the dust is ineffective.



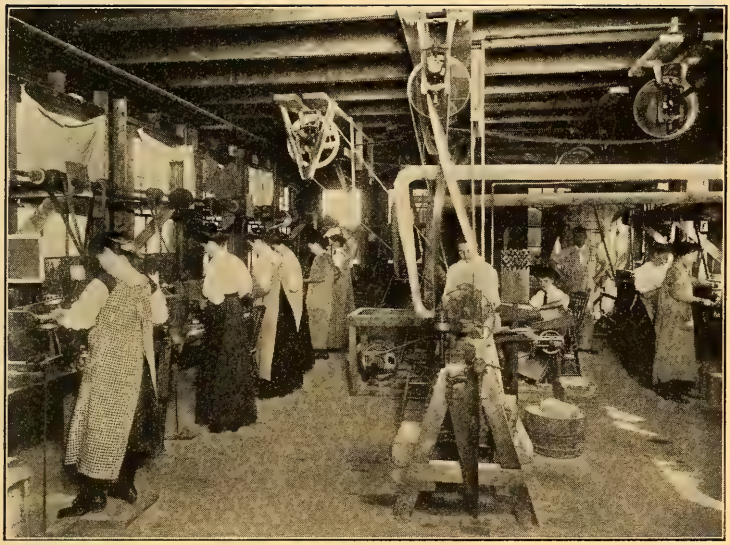
14. Facing, Grinding, Polishing, Doming, etc., Pearl Shells.

There is an exhaust blower system which is, to a certain extent, effective. The girls, however, are exposed to much dust which is not carried away.



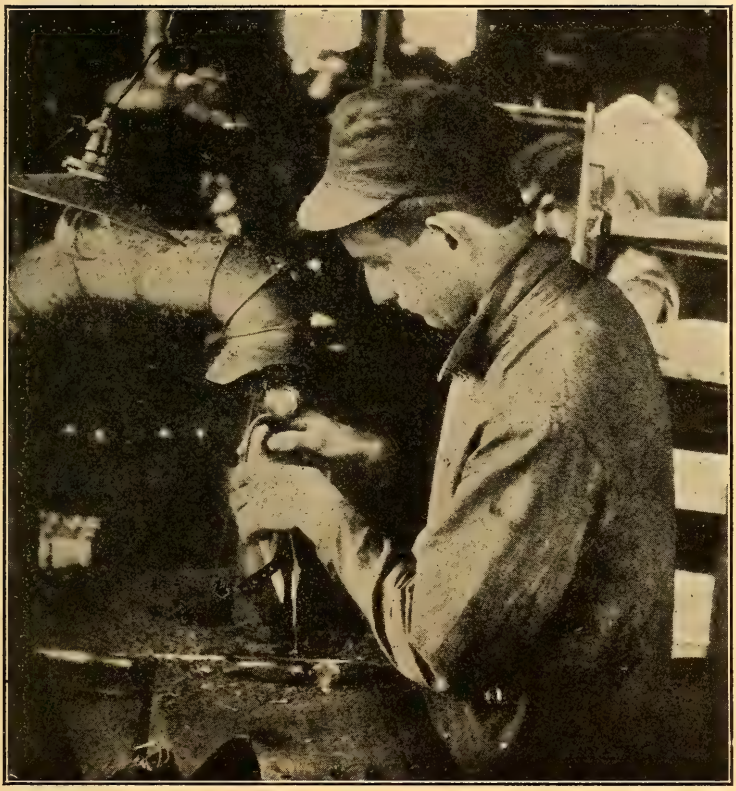
15. Facing, Grinding, Polishing, Doming, etc., Pearl Shells.

In this factory the work is done by men.



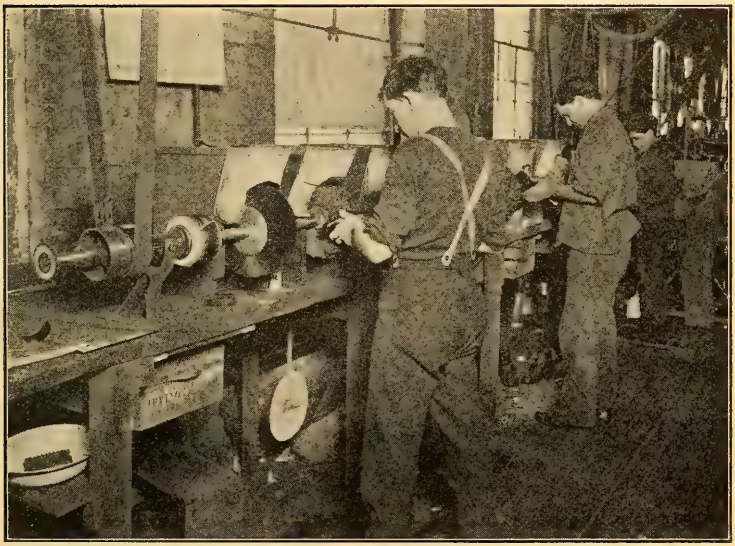
16. Facing, Grinding, Polishing, Doming, etc., Pearl Shells.

The women are exposed to considerable dust even with a fairly effective exhaust system.



17. Edge Trimming.

This picture shows a man trimming the edge of the sole of a shoe. The process gives rise to varying amounts of dust, the finest of which in well-equipped factories is sucked at once into the pipe. The work requires good light, accurate eyesight, considerable skill and close attention. Note the dust on the outside of the pipe, showing in this instance that the suction power was inadequate. In this industry fine leather dust is irritating to the respiratory tract, and naphtha fumes cause various forms of intoxication, especially in women.



18. Polishing.

Polishing is done with revolving bristle brushes and cloth wheels. Blacking is applied to the shoe bottom, wax is put on the brush or wheel and the bottom of the shoe is held against the brush or wheel, which revolves with great rapidity. More or less fine dust arises, consisting of wax, lint and blacking. The picture shows a rather crude arrangement for the protection of the employees against dust, but it is much better than no protection at all.



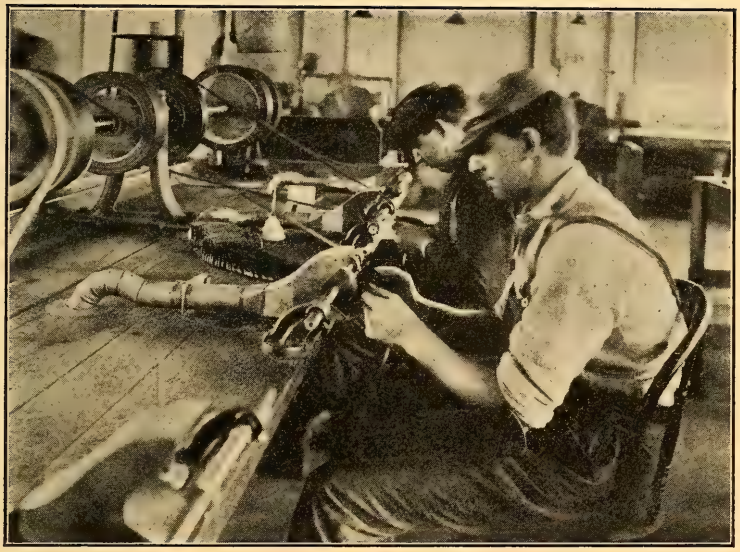
19. A "Rub Room."

Combs and hairpins are rubbed on rapidly revolving carpet balls, with a mixture of sifted coal ashes and water. The cloudy effect in the picture is due to the dust. The employees are always men.



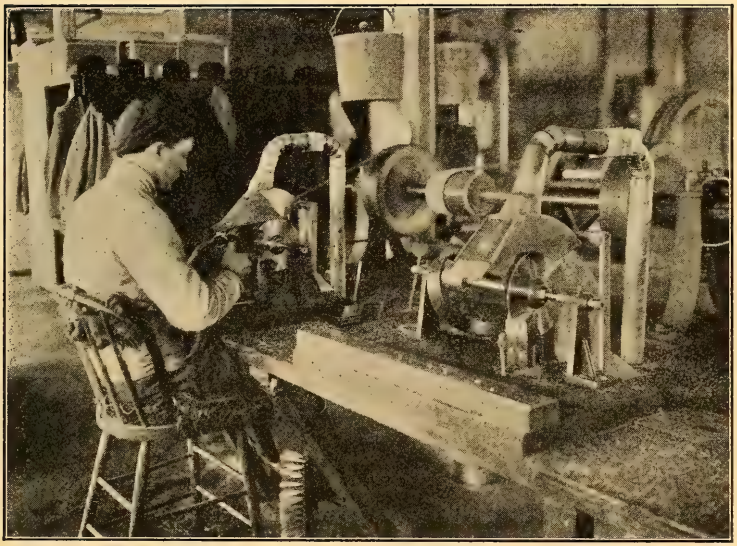
20. Rounding and Pointing Horn Hairpins.

Employees are generally young men and boys. (Horn dust is probably more irritating to the respiratory passages than bone dust.)



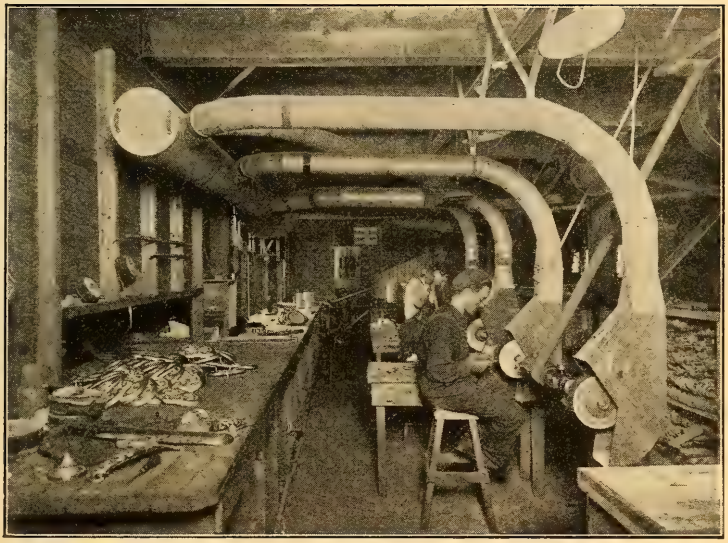
21. Pointing the Teeth of Celluloid Combs.

Sand wheels or steel burrs are used. The exhaust system in this case is quite as much for protection against fire as to prevent the inhalation of the dust.



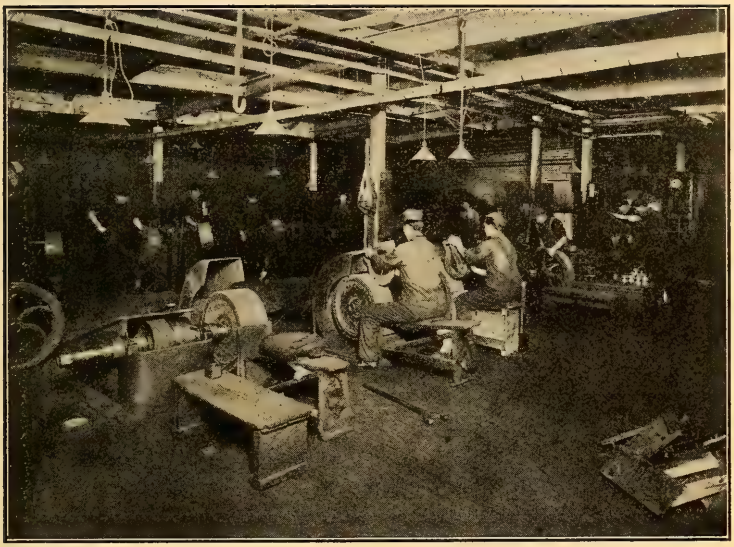
22. Shaping Teeth of Combs.

The "bottoming" saw is used to shape the bottom of the teeth of combs. Note the glass front to protect the employee's eyes against chips of celluloid.



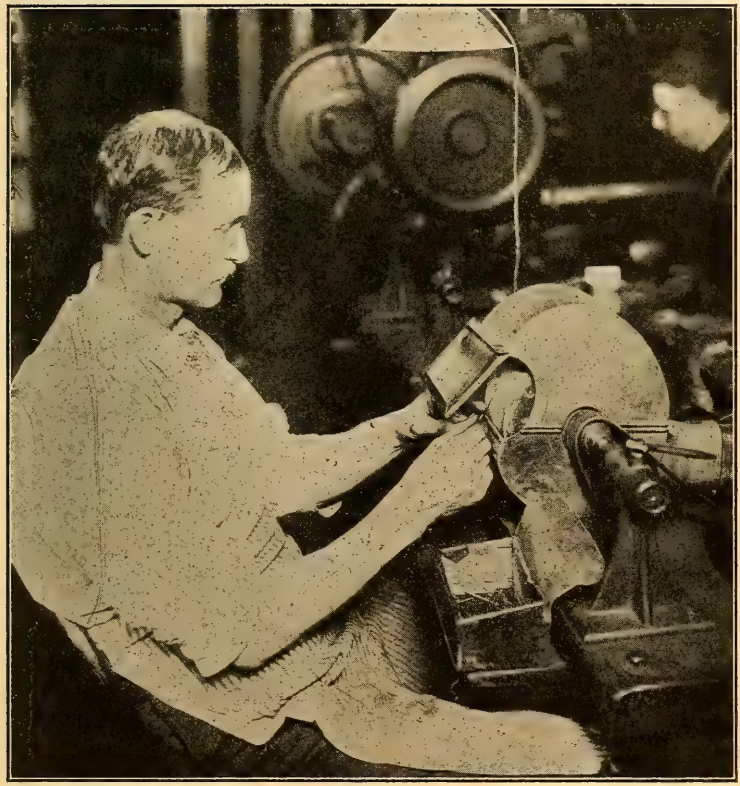
23. Grinding on Emery Wheels.

Effective exhaust system for the removal of dust.



24. Grinding on Heavy Emery and Corundum Wheels.

Adjustable hood for different sized castings. The dust is removed by a downward suction, which is both less expensive than forcing against gravity and gives a better protection to the employees. The belting is boxed in, thus preventing the escape of considerable dust. (A portion of the cover is removed for illustrative purposes.)



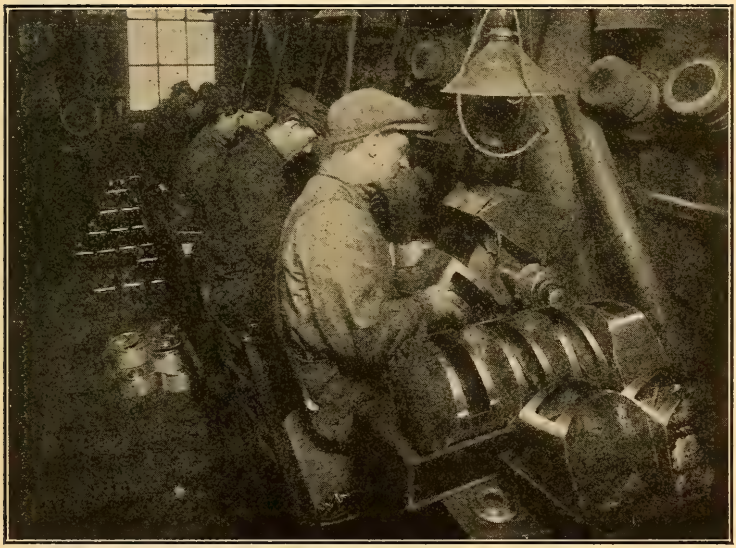
25. Pointing Awls.

Well-guarded emery wheel. The exhaust bonnet and glass plate are so made as to tilt at different angles. The exhaust pipe is horizontally placed.



26. Lead Working in the Manufacture of Storage Batteries.

Red oxide of lead and litharge are mixed together. One man doing this kind of work was found to be suffering from lead poisoning. The picture shows an employee wearing a respirator. The man was unwilling to wear long wristed gloves.



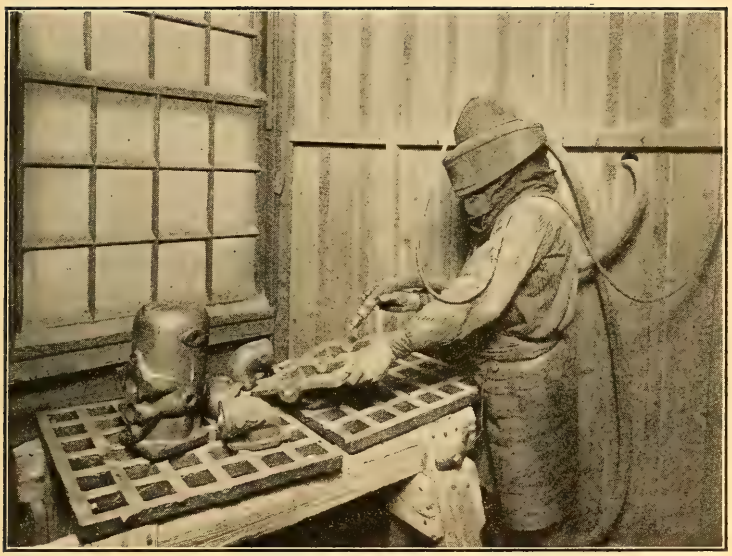
27. Grinding Steel Castings.

Note the means by which workmen are protected from flying dust.



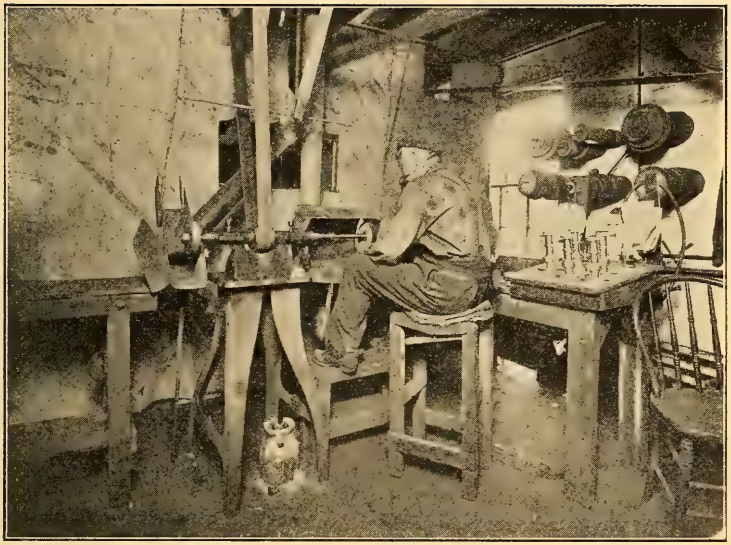
28 Sandblasting Castings.

The photograph shows how a sandblast is used. The cloudiness is due to excessive dust in the open shed. Men who do this kind of work, with the kind of helmet shown in the picture, are not properly protected, since the helmet does not prevent the inhalation of very fine steel, iron and brass dust.



29. Sandblasting Castings.

An improved helmet showing a small rubber tube going into the top, through which fresh air is supplied to the workman by a slight downward pressure. Note the accumulation of dust on the window framework.



30. Brass or Nickel Polishing.

The employee polishes brass or nickel on cotton buff balls. Sometimes he puts an emery wheel on the machine and does emery polishing. Until found by a State Inspector of Health, he was without protective devices for more than fifteen years. Now he wears a sponge over his mouth for a respirator, and, because of being so unfortunate as to have acquired tuberculosis, he has a canvas with a mica window separating him from other employees. The jar is used as a receptacle for spitting. The hood and exhaust system is not altogether effective.



31. The Stone Industry.

The workman is using a surfacing machine which is operated with compressed air. The strong blast of air keeps the granite clean, but gives rise to a great amount of dust, as shown in the picture. Of the mineral dusts granite is generally considered the most irritating.

RELATIVE TO TRADES, PROCESSES OF MANUFACTURE OR OCCUPATIONS INJURIOUS TO THE HEALTH OF MINORS UNDER EIGHTEEN YEARS OF AGE.

Chapter 404 of the Acts of Massachusetts of 1910 provides that the State Board of Health may exclude minors under the age of eighteen years from any trade, process of manufacture, occupation or method deemed by said Board to be sufficiently injurious to the health of such minors as to justify their exclusion therefrom.

CHAPTER 404, ACTS OF 1910.

Chapter five hundred and fourteen of the acts of the year nineteen hundred and nine is hereby amended by striking out section seventy-five and inserting in place thereof the following: — *Section 75.* The state board of health may from time to time upon the written application of any citizen of the commonwealth, or upon its own initiative, after such investigation as it considers necessary, determine whether or not any particular trade, process of manufacture or occupation, or any particular method of carrying on such trade, process of manufacture or occupation, is sufficiently injurious to the health of minors under eighteen years of age employed therein to justify their exclusion therefrom, and every decision so rendered shall be conclusive evidence of the facts involved therein, except so far as the same may later be revoked or modified by a subsequent decision of the board. Whoever, after being notified that the state board of health has determined that a particular trade, process of manufacture, occupation or method is injurious as above stated, employs therein a minor under eighteen years of age shall be punished by a fine of not more than two hundred dollars and not less than fifty dollars for each offence, unless prior to the time of such employment such determination shall have been revoked or modified so as not to include the employment complained of. [*Approved April 16, 1910.*

The State Board of Health hereby declares the processes named in the schedule hereunder to be injurious to the health of minors within the meaning of chapter 404, Acts of 1910, provided that the law shall not apply to any factory wherein such special measures are adopted as appear to the State Inspector of Health to be reasonably practicable and meet the necessities of the case: —

I. PROCESSES INVOLVING EXPOSURE TO POISONOUS DUSTS OR SUBSTANCES.

1. Processes in the manufacture of white, red, orange or yellow lead.

2. Processes in the manufacture of lead pipe, solder and plumbers' supplies.

3. Cutting metal articles with a mixture of lead and tin, or lead alone.

4. Processes involving exposure to lead and the dust of plumbago in electrotyping.

5. Processes involving the handling of white lead or lead monoxide (litharge) in rubber factories.

6. Lead paint grinding.

7. Lead working in the manufacture of storage batteries.

8. File cutting by hand.

9. Typesetting, cleaning or handling type in printing offices.

10. Glazing in pottery establishments.

II. Processes involving Exposure to Irritating Dusts.

1. Processes involving exposure to the dust of graphite in the manufacture of stove polish.

2. The operation of bronzing in the lithographing business, and the consequent exposure to bronze powder.

3. Cutlery grinding, and grinding or polishing in the manufacture of machinery, machine parts and metal supplies; and grinding, glazing or polishing on emery or buffing wheels.

4. Cutting, boring, turning, planing, grinding, doming, facing or polishing pearl shell.

5. Talc dusting in rubber works.

6. Sorting, dusting, cutting or grinding rags.

III. Processes involving Exposure to Poisonous Gases and Fumes.

1. Spreading rubber on cloth and the consequent exposure to naphtha in the manufacture of rubber goods.

2. The use of naphtha in cement work in rooms in shoe and rubber factories which are not provided with mechanical means of ventilation where the mixture containing naphtha is allowed to remain in uncovered receptacles.

3. Processes involving exposure to naphtha in the manufacture of japanned or patent leather.

4. Exposure to escape of fumes or gases from lead processes.

IV. Processes involving Exposure to Irritating Gases and Fumes.

1. Gassing in textile factories.

2. Singeing in print works, bleaching and dyeing works.

3. Dipping metal in acid solutions.

V. Processes involving Exposure to Extremes of Heat, and Other Conditions which promote Susceptibility to Disease.

1. Melting or annealing glass.

Approved July 7, 1910.

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Approved by
The State Board of Publication.

WEEKLY RETURNS OF DEATHS FROM CITIES AND TOWNS OF MORE THAN 10,000 POPULATION.

WEEK ENDING SEPT. 3, 1910.

CITIES AND TOWNS.	Population.[1] Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM—					
				Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	188	71	81	12	22	2	2	2
Worcester,	136,476	42	10	13	2	3	1	4	–
Fall River,	106,486	56	31	24	4	2	–	2	1
Cambridge,	102,112	26	9	6	4	–	1	–	–
Lowell,	96,380	33	19	14	4	4	–	–	–
New Bedford,	85,516	35	18	16	2	2	–	–	–
Lynn,	84,623	19	7	3	–	1	–	–	–
Springfield,	84,237	24	12	7	1	–	1	–	–
Lawrence,	78,000	31	15	12	–	2	–	–	–
Somerville,	76,049	14	6	5	–	1	–	–	–
Brockton,	55,039	14	2	3	1	1	–	–	–
Holyoke,	53,590	9	3	5	2	1	–	–	–
Malden,	41,941	8	2	2	–	–	1	–	–
Chelsea,	40,080	23	6	6	–	2	–	–	–
Newton,	39,642	9	4	3	3	–	–	–	–
Salem,	39,019	8	3	1	–	1	–	–	–
Haverhill,	38,362	13	7	7	–	1	–	–	–
Fitchburg,	34,263	13	6	3	2	–	1	–	–
Everett,	33,597	7	2	1	–	1	–	–	–
Quincy,	31,937	–	–	–	–	–	–	–	–
Taunton,	30,967	16	8	7	1	–	–	–	–
Waltham,	28,761	7	1	–	–	–	–	–	–
Pittsfield,	27,932	9	2	1	–	–	–	–	–
Brookline,	26,674	3	–	–	–	–	–	–	–
Gloucester,	26,011	14	3	2	1	–	–	1	–
North Adams,	22,150	5	3	2	–	–	–	–	–
Northampton,	21,075	8	3	–	–	–	–	–	–
Chicopee,	21,049	–	–	–	–	–	–	–	–
Medford,	20,921	3	1	1	1	–	–	–	–
Beverly,	16,386	4	0	1	–	1	–	–	–
Leominster,	16,030	3	–	–	–	–	–	–	–
Hyde Park,	15,609	4	3	1	–	–	–	–	–
Melrose,	15,459	6	2	1	–	–	–	1	–
Newburyport,	14,834	2	2	1	–	–	–	–	–
Revere,	14,820	6	2	–	–	–	–	–	–
Westfield,	14,750	7	3	3	–	2	1	–	–
Woburn,	14,522	8	1	1	–	–	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	4	3	2	–	–	–	–	–
Attleborough,	13,913	2	1	–	–	–	–	–	–
Adams,	13,685	1	1	1	–	–	–	–	–
Clinton,	13,105	0	–	–	–	–	–	–	–
Gardner,	13,066	4	4	2	–	–	–	–	–
Milford,	12,722	4	3	1	–	–	1	–	–
Watertown,	12,676	0	–	–	–	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	3	1	1	–	1	–	–	–
Weymouth,	11,798	5	2	–	–	–	–	–	–
Framingham,	11,749	3	2	1	–	–	–	–	–
Wakefield,	11,124	–	–	–	–	–	–	–	–
Webster,	11,109	2	–	–	–	–	–	–	–
Arlington,	10,520	4	2	–	–	–	–	–	–
Greenfield,	10,140	2	1	1	–	1	–	–	–
Recapitulation.									
Total of reporting towns,	2,337,591	711	287	242	40	49	9	10	3

[1] The populations were estimated upon the rate of growth from 1900 to 1905. Those of Taunton, Gloucester, North Adams and Clinton were allowed to stand as in 1905, having shown no increase during the five-year period. The gain in the population of Lowell is due to the annexation of a part of the town of Tewksbury. The population of Lawrence by the census of 1905 was 70,050, but, owing to the building of the new Wood and Arlington mills, an increase of about 8,000 is estimated by the Lawrence Board of Health, or 78,000.

WEEK ENDING SEPT. 10, 1910.

CITIES AND TOWNS.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM—					
				Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	196	80	90	16	16	3	4	1
Worcester,	136,476	46	21	9	1	2	–	1	–
Fall River,	106,486	49	21	26	4	4	1	2	1
Cambridge,	102,112	19	9	12	3	2	–	1	–
Lowell,	96,380	31	10	8	2	2	1	1	–
New Bedford,	85,516	35	22	17	–	3	1	–	–
Lynn,	84,623	23	11	9	4	2	–	1	–
Springfield,	84,237	31	15	11	6	1	–	–	–
Lawrence,	78,000	29	17	16	2	2	1	–	–
Somerville,	76,049	18	5	6	1	1	1	–	–
Brockton,	55,039	12	5	3	–	1	–	–	–
Holyoke,	53,590	22	13	11	1	–	–	1	–
Malden,	41,941	9	2	2	–	–	1	–	–
Chelsea,	40,080	13	5	2	2	–	–	–	–
Newton,	39,642	7	3	–	–	–	–	–	–
Salem,	39,019	14	4	3	–	2	–	1	–
Haverhill,	38,362	13	2	3	–	1	1	1	–
Fitchburg,	34,263	12	3	4	3	–	1	–	–
Everett,	33,597	3	–	1	–	1	–	–	–
Quincy,	31,937	–	–	–	–	–	–	–	–
Taunton,	30,967	17	10	12	2	–	–	–	–
Waltham,	28,761	9	2	6	2	2	–	–	–
Pittsfield,	27,932	6	2	1	–	–	–	–	–
Brookline,	26,674	7	2	–	–	–	–	–	–
Gloucester,	26,011	4	1	–	–	–	–	–	–
North Adams,	22,150	6	2	–	–	–	–	–	–
Northampton,	21,075	6	2	2	–	1	–	–	–
Chicopee,	21,049	10	5	3	–	2	–	–	–
Medford,	20,921	3	–	–	–	–	–	–	–
Beverly,	16,386	4	–	2	–	1	–	–	–
Leominster,	16,030	3	1	1	–	1	–	–	–
Hyde Park,	15,609	9	5	4	2	–	–	–	–
Melrose,	15,459	4	1	2	–	1	–	–	–
Newburyport,	14,834	5	1	2	–	–	–	2	–
Revere,	14,820	4	3	1	–	–	–	–	–
Westfield,	14,750	7	2	6	–	4	2	–	–
Woburn,	14,522	6	3	2	–	–	1	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	2	0	1	–	1	–	–	–
Attleborough,	13,913	2	0	–	–	–	–	–	–
Adams,	13,685	3	3	1	–	–	–	–	–
Clinton,	13,105	4	3	–	–	–	–	–	–
Gardner,	13,066	5	2	2	–	–	–	–	–
Milford,	12,722	5	3	–	–	–	–	–	–
Watertown,	12,676	0	–	–	–	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	4	1	1	–	–	–	–	–
Weymouth,	11,798	4	1	–	–	–	–	–	–
Framingham,	11,749	5	2	1	–	1	–	–	–
Wakefield,	11,124	–	–	–	–	–	–	–	–
Webster,	11,109	7	5	4	–	–	–	–	–
Arlington,	10,520	2	–	–	–	–	–	–	–
Greenfield,	10,140	3	2	–	–	–	–	–	–

Recapitulation.

Total of reporting towns,	2,358,640	738	312	287	51	54	14	15	2

WEEK ENDING SEPT. 17, 1910.

CITIES AND TOWNS.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	219	85	101	21	26	3	4	–
Worcester,	136,476	48	23	13	3	–	3	3	–
Fall River,	106,486	24	16	12	3	2	–	–	–
Cambridge,	102,112	26	13	13	3	3	–	–	–
Lowell,	96,380	36	18	5	1	1	–	1	–
New Bedford,	85,516	28	18	17	2	2	–	1	–
Lynn,	84,623	27	11	3	–	2	1	–	–
Springfield,	84,237	23	8	11	–	1	–	–	–
Lawrence,	78,000	27	12	12	1	2	–	–	–
Somerville,	76,049	18	7	7	3	1	–	–	–
Brockton,	55,039	9	1	2	–	–	–	–	–
Holyoke,	53,590	13	9	10	–	1	–	–	–
Malden,	41,941	13	5	7	2	–	–	–	–
Chelsea,	40,080	15	4	2	1	–	–	–	–
Newton,	39,642	8	2	2	1	–	–	1	–
Salem,	39,019	14	4	3	2	1	–	–	–
Haverhill,	38,362	10	1	3	1	1	–	–	–
Fitchburg,	34,263	12	7	1	1	–	–	–	–
Everett,	33,597	6	0	–	–	–	–	–	–
Quincy,	31,937	–	–	–	–	–	–	–	–
Taunton,	30,967	25	6	8	1	1	–	–	–
Waltham,	28,761	6	3	1	–	1	–	–	–
Pittsfield,	27,932	10	3	5	–	1	–	–	–
Brookline,	26,674	7	–	2	–	2	–	–	–
Gloucester,	26,011	4	–	–	–	–	–	–	–
North Adams,	22,150	7	2	4	1	1	–	–	–
Northampton,	21,075	9	1	5	–	3	–	–	–
Chicopee,	21,049	4	1	1	–	–	1	–	–
Medford,	20,921	1	–	–	–	–	–	–	–
Beverly,	16,386	4	1	1	–	1	–	–	–
Leominster,	16,030	4	1	1	–	1	–	–	–
Hyde Park,	15,609	6	1	2	–	–	1	–	–
Melrose,	15,459	3	1	–	–	–	–	–	–
Newburyport,	14,834	1	–	–	–	–	–	–	–
Revere,	14,820	4	2	1	–	1	–	–	–
Westfield,	14,750	–	–	–	–	–	–	–	–
Woburn,	14,522	4	2	–	–	–	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	3	1	1	1	–	–	–	–
Attleborough,	13,913	3	3	–	–	–	–	–	–
Adams,	13,685	2	2	–	–	–	–	–	–
Clinton,	13,105	3	2	–	–	–	–	–	–
Gardner,	13,066	3	0	1	–	–	–	1	–
Milford,	12,722	–	–	–	–	–	–	–	–
Watertown,	12,676	5	2	4	–	1	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	4	2	2	–	–	–	–	–
Weymouth,	11,798	3	–	–	–	–	–	–	–
Framingham,	11,749	5	4	2	1	–	–	–	–
Wakefield,	11,124	–	–	–	–	–	–	–	–
Webster,	11,109	6	2	5	1	–	–	–	–
Arlington,	10,520	1	–	–	–	–	–	–	–
Greenfield,	10,140	3	1	1	–	1	–	–	–

Recapitulation.

Total of reporting towns,	2,331,168	716	287	271	50	57	9	11	–

WEEK ENDING SEPT. 24, 1910.

CITIES AND TOWNS.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	227	101	96	19	19	4	2	–
Worcester,	136,476	44	15	10	4	–	–	1	–
Fall River,	106,486	41	19	19	3	3	–	1	–
Cambridge,	102,112	31	8	12	2	5	1	–	–
Lowell,	96,380	54	19	14	7	4	–	3	–
New Bedford,	85,516	43	21	18	5	4	–	–	–
Lynn,	84,623	23	5	2	–	1	–	–	–
Springfield,	84,237	21	7	8	–	–	1	1	–
Lawrence,	78,000	38	17	15	4	2	–	–	–
Somerville,	76,049	13	4	2	–	–	–	1	–
Brockton,	55,039	9	3	2	–	–	–	–	–
Holyoke,	53,590	15	5	5	2	–	–	–	–
Malden,	41,941	10	–	6	1	4	–	–	–
Chelsea,	40,080	5	1	2	–	1	–	–	–
Newton,	39,642	3	1	1	–	1	–	–	–
Salem,	39,019	15	5	3	3	–	–	–	–
Haverhill,	38,362	17	5	5	3	–	–	–	–
Fitchburg,	34,263	11	3	2	–	1	1	–	–
Everett,	33,597	3	1	–	–	–	–	–	–
Quincy,	31,937	–	–	–	–	–	–	–	–
Taunton,	30,967	19	8	12	3	–	–	–	–
Waltham,	28,761	6	4	1	1	–	–	–	–
Pittsfield,	27,932	18	5	4	3	–	–	1	–
Brookline,	26,674	3	1	1	–	1	–	–	–
Gloucester,	26,011	6	2	–	–	–	–	–	–
North Adams,	22,150	5	2	1	1	–	–	–	–
Northampton,	21,075	12	1	3	–	2	–	–	–
Chicopee,	21,049	6	4	–	–	–	–	–	–
Medford,	20,921	7	–	–	–	–	–	–	–
Beverly,	16,386	3	1	–	–	–	–	–	–
Leominster,	16,030	4	–	2	1	1	–	–	–
Hyde Park,	15,609	6	3	1	–	1	–	–	–
Melrose,	15,459	7	1	1	–	1	–	–	–
Newburyport,	14,834	6	1	–	–	–	–	–	–
Revere,	14,820	4	2	1	1	–	–	–	–
Westfield,	14,750	4	1	1	–	–	–	1	–
Woburn,	14,522	7	0	2	–	2	–	–	–
Peabody,	14,512	–	–	–	–	–	–	–	–
Marlborough,	14,456	3	0	–	–	–	–	–	–
Attleborough,	13,913	5	2	2	–	1	–	–	–
Adams,	13,685	5	2	1	–	–	1	–	–
Clinton,	13,105	3	1	2	–	1	1	–	–
Gardner,	13,066	4	–	–	–	–	–	–	–
Milford,	12,722	–	–	–	–	–	–	–	–
Watertown,	12,676	4	1	1	–	–	1	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	3	1	1	–	–	–	–	–
Weymouth,	11,798	2	–	1	–	1	–	–	–
Framingham,	11,749	3	1	–	–	–	–	–	–
Wakefield,	11,124	–	–	–	–	–	–	–	–
Webster,	11,109	4	4	4	–	–	–	–	–
Arlington,	10,520	2	1	–	–	–	–	–	–
Greenfield,	10,140	0	1	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,345,918	784	290	264	63	56	10	11	–

WEEKLY RETURNS OF DEATHS FROM CERTAIN INFECTIOUS DISEASES.

DEATHS FROM INFECTIOUS DISEASES NOT SPECIFICALLY MENTIONED IN ABOVE TABLES DURING THE WEEKS OF SEPT. 3, 10, 17 AND 24, 1910.

DISEASE.	Place.	WEEK ENDING—			
		Sept. 3.	Sept. 10.	Sept. 17.	Sept. 24.
Cerebro-spinal meningitis,	Boston,	–	1	1	–
	Haverhill,	1	–	–	–
	Lynn,	1	1	–	–
	New Bedford,	–	–	–	1
	Pittsfield,	–	1	–	–
	Southbridge,	–	–	1	–
	Waltham,	–	1	–	–
	Worcester,	2	1	–	–
Scarlet fever,	Boston,	1	1	–	–
	Lawrence,	–	–	–	1
	Lowell,	1	–	–	–
Whooping cough,	Boston,	2	2	2	1
	Cambridge,	1	–	–	–
	Fall River,	–	–	–	1
	Lawrence,	1	–	–	–
	Lowell,	1	–	–	–
	Lynn,	1	–	–	–
	Springfield,	–	1	–	1
	Watertown,	–	–	1	–
	Woburn,	–	1	–	–
	Worcester,	–	–	1	–
Erysipelas,	Boston,	2	2	–	–
	Springfield,	1	–	–	–
Tuberculosis, other than pulmonary.	Boston,	–	5	6	7
	Brockton,	–	–	1	–
	Cambridge,	–	–	1	–
	Chelsea,	2	–	–	–
	Gardner,	1	1	–	–
	Haverhill,	2	–	–	–
	Holyoke,	–	–	1	–
	Hyde Park,	–	1	1	–
	Lawrence,	–	2	–	1
	Lowell,	–	1	1	–
	Malden,	–	–	1	–
	Melrose,	–	1	–	–
	Northampton,	–	–	2	–
	Southbridge,	–	–	1	–
	Springfield,	–	–	1	–
	Worcester,	1	1	2	4

DEATHS FROM INFECTIOUS DISEASES, ETC. — *Concluded.*

DISEASE.	Place.	WEEK ENDING—			
		Sept. 3.	Sept. 10.	Sept. 17.	Sept. 24.
Meningitis other than cerebro-spinal.	North Adams,	–	–	1	–
Tetanus,	Springfield,	–	–	1	1
Anterior poliomyelitis,	Attleborough,	–	–	–	1
	Fall River,	2	–	–	–
	Springfield,	–	–	1	1
	Southbridge,	–	–	–	1
	Taunton,	–	–	–	1

WEEKLY RETURNS OF CASES OF INFECTIOUS DISEASES.

CASES OF INFECTIOUS DISEASES REPORTED DURING THE WEEKS OF SEPTEMBER 3, 10, 17 AND 24, 1910.

[Under the provisions of section 52 of chapter 75 of the Revised Laws.]

	WEEK ENDING—				
	Sept. 3.	Sept. 10.	Sept. 17.	Sept. 24.	Total.
Diphtheria,	125	97	122	170	514
Measles,	36	17	9	21	83
Scarlet fever,	63	68	79	80	290
Typhoid fever,	125	143	193	147	608
Tuberculosis, pulmonary,	140	100	125	112	427
Tuberculosis other than pulmonary,	2	1	1	1	5
Cerebro-spinal meningitis,	1	2	4	2	9
Meningitis other than cerebro-spinal,	–	–	2	1	3
Whooping cough,	23	17	27	24	91
Varicella,	–	4	3	6	13
Erysipelas,[1]	–	–	–	1	1
Mumps,[1]	5	1	–	1	7
Ophthalmia neonatorum,	6	7	5	5	23
Anterior poliomyelitis,	28	24	30	37	119
Tetanus,	2	–	1	–	3
Malaria,	–	2	3	1	6
Malignant pustule,	–	–	1	–	1

[1] Erysipelas and mumps are not diseases notifiable under section 52 of chapter 75 of the Revised Laws. The figures concerning these diseases are, therefore, incomplete.

MONTHLY REPORT ON INSPECTION OF FOOD AND DRUGS.

The following summary presents the results of the examination of food and drugs made by the State Board of Health during the month of September, 1910: —

Articles examined.	Number found to be of Good Quality.	Number adulterated or varying from the Legal Standard.	Total.	Articles examined.	Number found to be of Good Quality.	Number adulterated or varying from the Legal Standard.	Total.
Baking powder,	1	–	1	Meat products: —			
Butter,	2	1	3	Hamburg steak,	–	1	1
Canned fish,	2	–	2	Sausages,	8	4	12
Canned fruit, and vegetables,	3	–	3	Milk,	497	134	631
Cocoa,	2	–	2	Non-alcoholic drinks,	2	–	2
Coffee,	1	–	1	Olive oil,	11	1	12
Confectionery,	12	–	12	Oysters,	1	–	1
Cream,	7	2	9	Pastry,	2	–	2
Cream of tartar,	1	–	1	Peanut butter,	2	–	2
Drugs,	88	23	111	Pickles,	1	–	1
Extract of lemon,	1	–	1	Salad dressing,	1	–	1
Extract of vanilla,	1	–	1	Sugar,	5	–	5
Grape juice,	1	–	1	Spices,	6	–	6
Honey,	1	–	1	Table sauce,	2	–	2
Jams and jellies,	3	–	3	Vinegar,	3	4	7
Lemon juice,	1	–	1				
Malt liquor (ale),	3	–	3	Total,	671	170	841

The samples of drugs found to be adulterated were: gin, methyl alcohol, whiskey, spirit of peppermint, tincture of iodine, ointment of zinc oxide and a proprietary medicine.

The cities and towns in which samples were collected were: Andover, Arlington, Attleborough, Bedford, Beverly, Billerica, Blackstone, Boston, Brookline, Cambridge, Chelsea, Dedham, Fall River, Falmouth, Fitchburg, Hingham, Lowell, Lunenburg, Maynard, Medfield, Medford, Melrose, Nahant, Natick, Nantucket, Northbridge, Northampton, Oak Bluffs, Provincetown, Rutland, Salem, Somerville, Vineyard Haven, Wakefield, Waltham, Weymouth, Wellesley, Williamstown, Wilmington, Woods Hole and Worcester.

PROSECUTIONS FOR VIOLATIONS OF THE LAW RELATING TO FOOD AND DRUGS.

Ten convictions were secured during the month of September, 1910, for selling adulterated food, as follows: —

No.	Name of Defendant.	Place.	Character of Article sold.
1	Henry J. Manley. . . .	Boston, . .	Hamburg steak, [1]
2	Lawrence B. Avery, . .	Beverly, . .	Milk (total solids, 11.00).[2]
3	Amos P. Best, ...	Lowell, . .	Milk (total solids, 11.72).[2]
4	Wollaston Blair, . . .	Fall River, .	Milk (total solids, 10.70).[2]
5	Winthrop M. Brown, . .	Lunenburg, . .	Milk (total solids, 9.60).[2]
6	Evald Peterson, . . .	Waltham, .	Milk (total solids, 10.90).[2]
7	Frederick Tracy, . . .	Shirley, . .	Milk (total solids, 11.10).[2]
8	Dominick Di Sciello, . .	Boston, . .	Olive oil (100 per cent. cotton seed oil).
9	Chas. H. Watson, . . .	Fitchburg, .	Sausages (contained corn starch).
10	Arthur Lord, ...	Fall River, .	Vinegar.

[1] Contained Sulphurous Acid. [2] Watered.

Fines imposed, $400.

Number of Sample.	Character of Sample.	Name of Manufacturer, Wholesaler or Producer.	Results of Analyses.
6242 N	Pure olive oil,	Oneglia, Italy,	Cotton-seed oil.
6456 N	Camphor liniment,	A. W. Cunningham, Springfield, Mass.,	75 per cent. U. S. P. strength.
6442 N	Kefaline Headache Cure,	Kefaline Manufacturing Company, Boston, Mass.,	Contained acetanelid; no statement on label.
12887	Spirit of peppermint,	Castle Square Drug Company, Boston, Mass.,	70 per cent. U. S. P. strength.
5509 R	Milk,	Evald Peterson, Lexington, Mass.,	Total solids, 12.36 per cent.; fat, 4.30 per cent.; contained added water.
5511 R	Milk,	Evald Peterson, Lexington, Mass.,	Total solids, 10.90 per cent.; fat, 3.60 per cent.; contained added water.
5523 R	Milk,	Evald Peterson, Lexington, Mass.,	Total solids, 12.36 per cent.; fat, 4.20 per cent.; contained added water.
6330 N	Milk,	William C. Mackintosh, Newburyport, Mass.,	Total solids, 8.15 per cent.; fat, 0.30 per cent.; a watered skimmed milk.
12859	Milk,	Julia H. Tracy, Quincy, Mass.,	Total solids, 10.78 per cent.; fat, 3.10 per cent.; contained added water.
12860	Milk,	Julia H. Tracy, Quincy, Mass.,	Total solids, 10.79 per cent.; fat, 3.10 per cent.; contained added water.
5645 R	Milk,	John M. Cunningham, Malden Mass.,	Total solids, 11.52 per cent.; fat, 3.50 per cent.; contained added water.
5647 R	Milk,	John M. Cunningham, Malden Mass.,	Total solids, 11.52 per cent.; fat, 3.50 per cent.; contained added water.
5655 R	Milk,	Euclid Vallerand, Lowell, Mass.,	Total solids, 11.20 per cent.; fat, 3.50 per cent.; contained added water.
6350 N	Milk,	Albia Spyut, Ipswich, Mass.,	Total solids, 11.54 per cent.; fat, 3.70 per cent.; contained added water.
q 5636	Milk,	Fred J. Graham, Lynn, Mass.,	Total solids, 12.00 per cent.; fat, 4.00 per cent.; contained added water.
q 5646	Milk,	Frank S. McCarron, Lynn, Mass.,	Total solids, 11.30 per cent.; fat, 3.60 per cent.; contained added water.
q 5655	Milk,	Lecolst Bros., Lynn, Mass.,	Total solids, 10.46 per cent.; fat, 3.10 per cent.; contained added water.
q 5656	Milk,	Lecolst Bros., Lynn, Mass.,	Total solids, 10.40 per cent.; fat, 2.90 per cent.; contained added water.

LIST OF ADULTERATED OR IMPROPERLY LABELED FOODS, ETC. — *Concluded.*

Number of Sample.	Character of Sample.	Name of Manufacturer, Wholesaler or Producer.	Results of Analyses.
q 5659	Milk,	Vurtick Demirkiolian, Bellingham, Mass.,	Total solids, 11.45 per cent.; fat, 2.30 per cent.; proteid, 3.36 per cent.; skimmed milk.
12781	Milk,	Thomas W. Cole, West Gloucester, Mass.,	Total solids, 11.00 per cent.; fat, 3.90 per cent.; contained added water.
12782			Total solids, 11.05 per cent.; fat, 3.90 per cent.; contained added water.
6404 N	Milk,	James A. Lawrence, Gloucester, Mass.,	Total solids, 11.30 per cent.; fat, 3.80 per cent.; contained added water.
6418 N	Milk,	William F. Marshall, West Gloucester, Mass.,	Total solids, 11.48 per cent.; fat, 3.60 per cent.; contained added water.
5475 R	Milk,	James A. Lawrence, Gloucester, Mass.,	Total solids, 7.88 per cent.; fat, 2.20 per cent.; contained added water.
12824	Milk,	Gloucester Dairy Company, Gloucester, Mass.,	Total solids, 10.00 per cent.; fat, 3.10 per cent.; contained added water.
12825			Total solids, 10.00 per cent.; fat, 3.10 per cent.; contained added water.
12826			Total solids, 9.20 per cent.; fat, 2.80 per cent.; contained added water.
5715 R	Milk,	Lemuel Friend, Jr., Gloucester, Mass.,	Total solids, 10.60 per cent.; fat, 3.20 per cent.; contained added water.
5737 R	Milk,	Charles J. Nugent, Rockport, Mass.,	Total solids, 11.40 per cent.; fat, 3.70 per cent.; contained added water.
5727 R	Milk,	John P. Madruga, Gloucester, Mass.,	Total solids, 10.56 per cent.; fat, 2.10 per cent.; proteid, 2.91 per cent.; skimmed milk.

INSPECTION OF DAIRIES.

During the month of September, 1910, 181 dairies were examined in the following places: —

Place.	Number examined.	Number found to present no Objectionable Features.	Per Cent.	Number concerning which Letters were sent.	Per Cent.
Athol,	7	5	71.43	2	28.57
Second inspection,	9	6	66.67	3	33.33
Georgetown,	2	2	100.00	–	–
Second inspection,	7	7	100.00	–	–
Holliston,	3	3	100 00	–	–
Second inspection,	24	18	75.00	6	25.00
Third inspection,	4	3	75.00	1	25.00
Hopkinton,	2	1	50.00	1	50.00
Second inspection,	28	19	67.86	9	32.14
Medway,	2	–	–	2	100.00
Mendon,	–	–	–	–	–
Second inspection,	7	5	71.43	2	28.57
Milford,	21	13	61.90	8	38.10
Second inspection,	7	5	71.43	2	28.57
Millis,	1	–	–	1	100 00
Petersham,	20	12	60.00	8	40.00
Royalston,	2	1	50.00	1	50.00
Second inspection,	3	1	33.33	2	66.67
Templeton,	1	1	100.00	–	–
Second inspection,	12	9	75.00	3	25.00
Winchendon,	8	5	62.50	3	37.50
Second inspection,	11	9	81.82	2	18.18

Total number of dairies examined,	181
Number found to be free from objectionable conditions,	125
Number concerning which letters were sent,	56
Total number of conditions to which attention was called,	104
Percentage of dairies which passed inspection,	69.06

In addition to the above, 62 dairies were visited at which the sale of milk had been discontinued.

The names of the owners of the dairies found to be worthy of commendation follow: —

Athol.

Class B.

Athol Town Farm
Drew, Jefferson M.
Ellenwood, Daniel
Farrington, E. A.*
Faulkner, W. W.*
French, Warren F.
Haven, E. J.*
Hood, H. L.
Rounds, G. E.* †
Sedgeley, A. Roy *
Vaughn, C. E.* †

Georgetown.

Class B.

Batchelder, Samuel P.* †
Bond, D. P.* †
Georgetown Town Farm * †
Jackson, J. F.
Johnson, Charles * †
Jones & Holt * †
Noyes, Charles * †
Pickett, Edward L.
Tenney, G. D.*

* Second inspection. † Reported favorably on first inspection.

Holliston.

Class A.

Smith, L. E. P.

Class B.

Abber, Jacob *
Adams, C. W.*
Brooks, George E. W.‡
Bullard, H. E.*
Louis Bullard * †
Cutler, Henry * †
Cutler, Mary E.* †
Davern, J.*
Eames, William
Flagg, George * †
Gooch, A. H.‡
Gordon, A.*
Hall, Charles *
Howard, Charles A.*
Leonard, E. E.*
Marchant, W. E.* †
Morse, Willard
Nottage, F. A.* †
Shaw, William * †
Sherman, G. H.*
Wallinger, Carl P.‡
Willey, B. F.*
Wilson, C. A.*

Hopkinton.

Class A.

Baldwin, F. F.* †
Dewey, F. E.*

Class B.

Ball, Charles *
Brown, C. W.
Bruce, E. M.*
Claflin, W. W.* †
Creeden, D. J.*
Frail, Ernest *
Hayes, A. S. * †
Hemenway, Harry *
Hopkinton Town Farm *
Larsen, Peter *
Macbeth, Walter *
Mann, J. A.*
Phipps, A.*
Porter, Miriam *
Regan, Arthur *
Roach, T.*
Terry, John *
Ward, C. I.*

Mendon.

Class B.

Estey, John W.* †
Gaskill, Albert *
Parkinson, G. A.* †
Quigley, James *
Taft, George M.*

Milford.

Class A.

Day, Frank A.

Class B.

Anderson, Carl
Bell, Amos
Clark, Chester L.*
Codman, Alfred
Cronan, P. T.*
Doe, Alfred
Gordon, William
Hart, Charles
Lawson, John
Lucier, Frank *
Milford Town Farm * †
Miller, Hiram *
Morey Bros.
Newton, Fred
O'Brien, Michael
Theibedean, Mark
Walker, F. M.

---

* Second inspection. † Reported favorably on first inspection. ‡ Third inspection.

PETERSHAM.

Class B.

Amidon, Josiah C.
Bryant, Walter
Coolidge, Charles
Gale, Philip S.
Glasheen, John G.
Harty, Joseph
Johnson, Arthur
Phillips, Ernest E.
Pocket, John
Simes, William
Spooner, Benjamin W.
Towne, Dwight

ROYALSTON.

Class B.

Cross, Fred W.*
Neal, A. W.

TEMPLETON.

Class B.

Bass, John * †
Brooks, John
Brown, Louis M.* †
Grey, William * †
Harwood, Augustus * †
Heilman, Alfred *
Nygard, John *
Stiles, G. E.* †
Stone, George E. *
Woodward, Clarence *

WINCHENDON.

Class B.

Beaman, George * †
Buckley, Cornelius
Cooper, George W.
Drury, Mrs. L. J.*
Epps, C. Bertram
Joslin, C. H.*
Mack, Harry *
McConnell, Allen F.
McDonald, Patrick
Morlock, C. H.*
Morlock, P. A.*
Morlock, W. E.* †
Vaine, Joseph * †
Winchendon Town Farm *

INFECTIOUS DISEASES AND THE MOUTH.[1]

BY WILLIAM R. WOODBURY, M.D., BOSTON, U. S. A.

Medicine is taking striking direction towards the prevention of disease. Dentistry should grow in the same direction. It leads to new and broad fields of practical usefulness. The way stands open. A fertile field for research work is in the causal relation of mouth conditions to infectious diseases. Upon your profession falls the obligation to make some record of these facts. Medical literature has almost no mention of them. My hope is that this paper may stimulate work in this new field.

Within recent years the discovery has been made that the most com-

* Second inspection.

† Reported favorably on first inspection.

[1] Read before the International Dental Congress in Berlin, Aug. 25. 1909. Reprinted from the "Boston Medical and Surgical Journal," Jan. 27, 1910.

mon physical defect in school children is decayed teeth. Dr. Jessen has revealed the startling fact that in Strassburg and throughout the German empire 90 per cent. of school children carry this defect. An examination of 187,000 children in the public schools of New York City shows that defective teeth more than doubles all other physical deficiencies. There are 600,000 school children in New York City, and nearly 65 per cent. of those examined were found to be dental cripples; and the examinations were made by medical men who recognize only gross dental conditions. An examination of 500 school children who came to the dental clinic of the Children's Aid Society Industrial School in New York City found only 14 of that number who had sound teeth, and these were sadly in need of a dentist's attention.[1]

Next highest in the list of physical defects found in the New York City school children are enlarged tonsils and defective nasal breathing. Thirty per cent. of them have those defects.

In the public schools of Boston the school nurses find decayed teeth in fully 75 per cent. of the pupils. An examination under the direct supervision of a dentist, Dr. William H. Potter, of the mouths of the children in the public schools of Brookline, Mass., discovered that it is the exception to find a child with sound, normal teeth.[2] In Pennsylvania, New Jersey and Ohio the investigations of Professor Davison of Lafayette College reveal the same serious condition among school children. Ninety per cent. of all children in Germany, the United States and England are beginning life seriously handicapped with deficient teeth.

Dental cripples cannot get full nutritive value from their food. But partially digested food as it passes through the body gives up but a part of its nourishment; it does not make full growth and development; it clogs the system. Constipation is an evil and a breeder of evils; it lowers the vitality and it weakens the defense of the individual against disease of every kind. Mal-nutrition makes defective children; and bad teeth are both cause and effect of this condition.

Unsound and irregular teeth, enlarged tonsils and adenoid growths are closely related, and evidence is collecting to indicate that neglected teeth and a foul mouth are a cause of pathological enlargement of tonsils and adenoids. In Knoxville, Tenn., Dr. J. W. Carmichael, medical inspector of schools, found in 349 school children 152 with decayed teeth and 82 with enlarged tonsils. Neglect of the teeth in the early years of life, unhygienic eating habits and obstruction to the entrance to

[1] This examination was made by Dr. Van Winkle, under the supervision of Dr. Arthur H. Merritt, and Dr. Baker, of the Bureau of Child Hygiene.

[2] This is the first thorough examination in the United States of the teeth of school children made by a dentist at the request of a public school board.

the lungs of the needful amount of air causes narrow chests, round shoulders, poor blood and repeated attacks of nose, throat and bronchial affections. Neglect causes permanent facial malformations.

"There are four periods," says Dr. George H. Wright,[1] "in the development of the individual from two years to eighteen years when the tonsils become slightly enlarged without inflammation, and without obstruction or evidence of suppuration, and these four periods are represented practically at the time when four groups of molars are in process of eruption. That is, the periods with slight variations are from two years for the first group; six years of age, the second group; twelve years, the third group; and from seventeen, the fourth group. There may be later tonsillar enlargement due to infection from various sources, particularly the teeth." These facts give reason to think that neglected mouth conditions are factors in infectious diseases.

Lodgment of infectious germs in the mouth, and the favorable soil for their growth and development which foul mouths are ever ready to offer, favor these diseases. Difficult though it may be to bring a direct charge of infection against this source, there is a perfectly reasonable probability that diphtheria, scarlet fever, measles and tuberculosis originate under such conditions.

During the school year ending June 30, 1909, the nursing division of the department of school hygiene in Boston has had under its care 51,457 children out of an elementary school population of 82,971, and decayed teeth have been found in not less than 75 per cent. of these children. During the past five years there were in Boston 39,042 cases of diphtheria, scarlet fever and measles, with 1,467 deaths. In the city of New York during the same period 231,480 cases of these three diseases were reported to the health authorities, and 17,229 resulted in death. These are eloquent figures. They proclaim an appalling waste of time, money and efficiency, and a death-loss of unwarrantable disproportion. Neglect of any possible way by which disease may gain entrance to the body, and particularly of such an open and ready entrance as a foul mouth, is unscientific. A scientific method of dealing with disease includes every factor which may be a predisposing or exciting cause. Full advantage comes only through such a method. Even though a direct charge of infection cannot be established against a neglected mouth, a lowered resistance to disease through malnutrition and the pernicious physical states it causes are factors which should be recognized.

Only 8 per cent. of the community take care of their teeth. Children

[1] "A Functional Relation of the Tonsils to the Teeth." George H. Wright, D.M.D., Boston. Reprint from "Boston Medical and Surgical Journal," May 20, 1909.

never keep the gateway to their bodies clean unless driven to it persistently by their parents; and children have a habit of not thoroughly chewing their food. Physicians and parents fail to recognize the necessity of good natural teeth and a clean mouth.

Enlarged tonsils are a predisposing cause of diphtheria. "Doubtless the condition of the mouth is of importance in many diseases of the alimentary canal, and certainly it plays a great rôle in infectious diseases," says Lœffler. Tonsillar enlargement follows infection from neglected teeth as well as being an associated condition of the process of molar eruption. Three conditions are favorable to bacterial development — warmth, darkness and nourishment. All these conditions are present in a mouth in which decomposing food is permitted to accumulate around the teeth and in the cavities made by decay. Cavities are culture tubes. Tooth-rot offers nourishment for germ life. Diphtheria, therefore, particularly its prevention, should be considered in its relation to this fact. Treatment against diphtheria is most effective when it is begun during the incipient stage of the malady. Children more than adults are susceptible to this disease. They put everything into the mouth, and they play in close contact with one another.

Well persons carry disease germs. They may show no signs of illness; the physician cannot tell by their appearance or by old-fashioned methods that any disease is present. By all the ordinary standards the man or the child is well, but he is distributing infectious germs. An ideal "carrier" is the person who neglects his mouth so that it is in a constant condition of foulness, and whose teeth, eaten away by tooth-rot, are merely hollow cavities filled with decomposing food and disease germs. The germs which are harmless to the carrier may, under favoring conditions, become virulent. The person receiving the bacilli may, in turn, develop them and become himself a carrier; or he may fall ill, his vital resistance not being able to withstand the infection.

In an investigation undertaken in 1900–01 by the Massachusetts Association of Boards of Health, between 4,000 and 5,000 "well" throats were examined, and more than 1 per cent. were found to carry diphtheria germs. Of the three typical forms of diphtheria bacilli accepted by the committee in charge of this investigation, an average of well persons carrying one or more of these forms is about 1.4 of the population, — in Boston more than 8,000 persons. A minor examination of the members of families in which there were or had been clinical diphtheria found that from 8 per cent. to 50 per cent. of the well members of these families carried diphtheria bacilli. Sound teeth and healthy resistant mucous membrane offer a less favorable soil for infectious germs.

Carriers among school children work much evil. The opening of the

schools in the autumn augments appreciably the number of cases of diphtheria, and the close relations of school life is a determining factor in diphtheria epidemics.

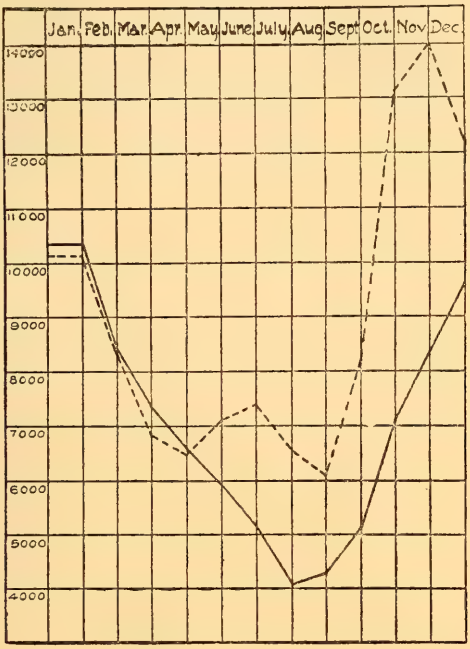


Chart computed from the United States Census Report to show how the opening of the schools in autumn increases diphtheria.

The broken line shows the number of cases among school children five to fourteen years old during 1900-04 in the registration area of the United States. The unbroken line shows the number of cases among children, from birth to five years of age for same period and area.

On this chart the augmented increase in diphtheria among school children from five to fourteen years of age, as compared with children under five years, is strikingly shown.

What is true of diphtheria is true, in some measure, of scarlet fever and measles. The virus of scarlet fever is supposed to be contained in the secretions from the nose and mouth. There is some doubt as to what extent, if any, the infective agent of this disease is conveyed by the scales of desquamating skin. Frequently a person who, to all appearances, has recovered from scarlet fever, who has had no complications and who has finished peeling, remains infectious for months. He is known to cause fresh cases. With the present knowledge of this dis-

ease it is impossible to say positively in which part of the body the infection lingers. There is evidence that it remains in the lining membrane of nasal and oral passages which are not in a healthy state. The micro-organisms of scarlet fever may be present in the mouth and fauces without giving rise to any trouble until inflammation is set up by some other factors, and particularly if those parts are not in a healthy state. Adenoid growths, sore nostrils and swollen tonsils are recognized as conditions which favor infectious disease. Diseased teeth are factors which create an unhealthy condition of the lining membrane of the mouth and pharynx, and the inflammation they are responsible for may be the determining cause for the development of disease. Scarlet fever is chiefly a disease of childhood and young adults, and these are the ages when the teeth and mouth are most neglected.

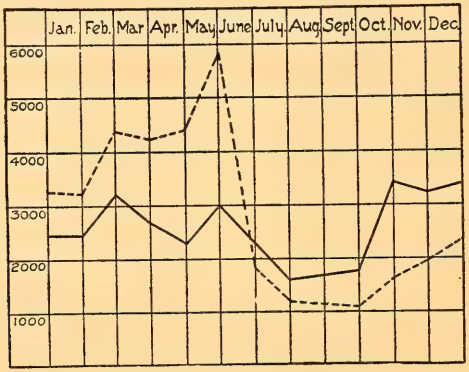


Chart constructed from the report of the Public Health and Marine-Hospital Service for the six largest cities in the United States in 1908.

The broken line shows the number of cases of scarlet fever reported in each month, and the unbroken line those of diphtheria.

No causal relation between diseased teeth or a foul mouth and measles has been discovered. All diseases are related in some way to every organ of the body, and a chronic state of mal-nutrition such as results from defective teeth is a part of the vicious circle of disease. Frequently bronchopneumonia follows an attack of measles, and a secondary bronchopneumonia may result in death. Pneumococci inhabit the mouths of apparently healthy individuals. These germs, under favoring conditions, become virulent and cause disturbances which are peculiar to them. A mouth and teeth in a healthy condition lessen the chance of this complication of measles.

Mouth conditions are of practical importance in tuberculosis. The teeth are a significant index of internal conditions. In the prevention

of tuberculosis the largest benefit comes from sanitary conditions, and mouth sanitation is of the first importance. Malnutrition increases susceptibility to infection. It lowers resistance after infection has begun; it deprives the body of its natural forces in combating disease. To prevent tuberculosis from gaining a foothold, and to counteract it after it has invaded the system, a generous amount of uncontaminated food is demanded. Tuberculosis is a chronic disease, and a continual reinfection through but partially chewed food contaminated with infection stored in a dirty mouth and given to the intestines to absorb is a hopeless fight against an insidious foe. Food mixed with tuberculous sputum is not a wholesome diet.

Pathological research shows an astounding prevalence of tuberculosis in the early years of life. Von Pirquet, in his clinical work, found tuberculosis to be present in some form in 70 per cent. of a large series of children under fourteen years of age. This is a fact of large significance. By detecting latent tuberculosis among children, and giving them proper hygienic care, much can be accomplished by way of prevention in combating this scourge.

In Boston the death-rate from consumption has been reduced in the past twenty-six years 60 per cent. — from 42.26 to 17.26 per 10,000 inhabitants. This continued reduction in the death-rate should give needed encouragement to the community. It helps to ease the anxious dread created by the startling statements concerning tuberculosis. The whole man is involved in the fight against disease. Sound natural teeth and every tooth in its appointed place doing its full work are essential to the whole individual. Surer protection against disease comes to a whole child. Cleanliness of the mouth and teeth is a simple means of protection; it is a means of prevention directly within the control of the individual.

There are signs that a better appreciation of mouth hygiene is developing. Active expression of this appreciation is growing. Nutrition is one of the large questions underlying individual and civic health. Human efficiency rests upon it. No one stands closer to this question than the dentist. Preventive dentistry is attaining its just place; it is recognized as a distinct subject of study. With unmistakable purpose the dental profession should make itself felt in the work for the prevention and control of constitutional and infectious diseases.

SALIVA AND FINGERS IN THE SPREAD OF INFECTIOUS DISEASE.[1]

In connection with the foregoing article we quote from a recent publication by Dr. Charles V. Chapin, superintendent of health, Providence, R. I., entitled "The Sources and Modes of Infection."

The importance of the secretions of mouth and nose in the spread of certain infectious diseases, especially scarlet fever and diphtheria, has been emphasized in all works dealing with these diseases. It is important, furthermore, to know that the experience of Flexner and others seems to point to these same secretions as the medium of transfer for anterior poliomyelitis. The manner in which these secretions may be transferred, through the multiplicity of human relations, is very graphically described by Dr. Chapin.

Contact with Saliva. — If contact infection is important in such diseases as gonorrhea, typhoid fever, dysentery and cholera, in which the infecting material is not constantly at hand, and is usually strenuously avoided, how much more important must this mode of transference be in diseases in which the specific germs are found in the secretions of the nose and mouth or in the sputum.

Danger from Fingers. — Probably the chief vehicle for the conveyance of nasal and oral secretion from one to another is the fingers. If one takes the trouble to watch for a short time his neighbors, or even himself, unless he has been particularly trained in such matters, he will be surprised to note the number of times that the fingers go to the mouth and the nose. Not only is the saliva made use of for a great variety of purposes, and numberless articles are for one reason or another placed in the mouth, but for no reason whatever, and all unconsciously, the fingers are with great frequency raised to the lips or the nose. Who can doubt that if the salivary glands secreted indigo the fingers would continually be stained a deep blue, and who can doubt that if the nasal and oral secretions contain the germs of disease these germs will be almost as constantly found upon the fingers? All successful commerce is reciprocal, and in this universal trade in human saliva the fingers not only bring foreign secretions to the mouth of their owner, but there, exchanging them for his own, distribute the latter to everything that the hand touches. This happens not once, but scores and hundreds of times during the day's round of the individual. The cook spreads his saliva on the muffins and rolls, the waitress infects the glasses and spoons, the moistened fingers of the peddler arrange his fruit, the thumb of the milkman is in his measure, the reader moistens the pages of his book, the conductor his transfer tickets, the "lady" the fingers of her glove. Every one is busily

[1] "The Sources and Modes of Infection," Dr. Charles V. Chapin. John Wiley & Sons, 1910.

engaged in this distribution of saliva, so that the end of each day finds this secretion freely distributed on the doors, window sills, furniture and playthings in the home, the straps of trolley cars, the rails and counter and desks of shops and public buildings, and, indeed, upon everything that the hands of man touch. What avails it if the pathogens do die quickly? A fresh supply is furnished each day.

Drinking Cups. — Another important vehicle of transfer must be the common drinking cup. Davison[1] estimated that there were as many as 20,000 epithelial cells on a drinking glass that had been in use in a school for nine days, which well illustrates the amount of infection which may be thus carried. Cars, steamboats, hotels, schools, offices, factories, theaters, churches, all provide a common vessel from which large numbers of persons drink, thus furnishing an almost ideal method by which perfectly fresh saliva may be transferred from one to another. Hundreds of thousands of persons must be each day in this manner exchanging the secretions of the mouth. When traveling in the steam cars I have noticed the shocked expression on the face of passengers as a fashionably dressed woman was seen to allow her pug dog to drink from the common glass, — not a pleasant thing, of course, but infinitely less dangerous than for the woman to drink from it. She might have tuberculosis, or carry diphtheria bacilli, or perhaps even have mucous patches on her lips.

Other Kinds of Contact. — Besides the moistening of the fingers with saliva and the use of the common drinking cup, the mouth is put to numberless improper uses which may result in the spread of infection. It is used to hold pins, string, pencils, paper and money. The lips are used to moisten the pencil, to point the thread for the needle, to wet postage stamps and envelopes. Children "swap" apples, cake and lollipops, while men exchange their pipes and women hatpins. Sometimes the mother is seen "cleansing" the face of her child with her saliva-moistened handkerchief, and perhaps the visitor is shortly after invited to kiss the little one.

Children have no instinct of cleanliness, and their faces, hands, toys, clothing and everything that they touch must of necessity be continually daubed with the secretions of the nose and mouth. It is well known that between the ages of two and eight years children are more susceptible to scarlet fever, diphtheria, measles and whooping cough than at other ages, and it may be that one reason for this is the great opportunity that is afforded by their habits at these ages for the transfer of the secretions. Infants do not of course mingle freely with one another, and older children do not come in such close contact in their play, and they also begin to have a little idea of cleanliness. . . .

When one notes the utter disregard of medical asepsis shown in our hospitals and medical congresses, one is apt to feel that the education of the public in habits of personal cleanliness will take a very long time; but some encouragement is felt when it is remembered that it is not so very long ago

[1] Davison, Tech. World Mag., Chicago, 1908, IX., 623.

that excrement was commonly thrown into the street and garbage was tossed under the tables of the great. It is only a few years since our sidewalks were flecked with saliva, but now nineteen persons out of twenty are ashamed to be caught spitting on the pavement. Perhaps we may all soon learn to stop distributing our secretions so freely among our friends.

Education in School. — As the avoidance of contact infection is chiefly a personal matter, the present need is for education. First of all, the teachers in the medical schools and the staffs of hospitals must learn to appreciate the importance of this mode of infection. It is not unreasonable to hope that in a few years the schools and the hospitals will place as much emphasis on medical asepsis as they now do on surgical asepsis, and it is to these centers that we must look for the education of physicians, health officers and nurses. To educate the general public is a more difficult matter. Some years ago Dr. Theobald Smith called my attention to the desirability of teaching school children something about the requirements of personal cleanliness, and since then I have each year distributed to each school child the following "don'ts:" —

Remember these Things.

Do not spit if you can help it. Never spit on a slate, floor or sidewalk.

Do not put the fingers into the mouth.

Do not pick the nose or wipe the nose on the hand or sleeve.

Do not wet the finger in the mouth when turning the leaves of books.

Do not put pencils into the mouth or wet them with the lips.

Do not put money into the mouth.

Do not put pins into the mouth.

Do not put anything into the mouth except food and drink.

Do not swap apple cores, candy, chewing gum, half-eaten food, whistles or bean blowers, or anything that is put into the mouth.

Never cough or sneeze in a person's face. Turn your face to one side.

Keep your face and hands clean; wash the hands with soap and water before each meal.

PROPRIETARY PREPARATION ADVERTISED AS UNSALABLE IN SEPTEMBER, 1910.

Kefaline: The Celebrated Headache Cure. Manufactured by The Kefaline Company, Boston, Mass.

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OF

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Approved by
The State Board of Publication.

WEEKLY RETURNS OF DEATHS FROM CITIES AND TOWNS OF MORE THAN 10,000 POPULATION.

WEEK ENDING OCT. 1, 1910

CITIES AND TOWNS.	Population.[1] Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	218	72	85	27	16	2	4	–
Worcester,	136,476	57	15	12	7	1	–	2	–
Fall River,	106,486	38	15	20	7	2	–	–	–
Cambridge,	102,112	36	7	13	4	5	2	–	–
Lowell,	96,380	26	12	9	5	1	–	1	–
New Bedford,	85,516	30	15	18	2	2	1	2	–
Lynn,	84,623	24	8	4	2	1	1	–	–
Springfield,	84,237	22	5	8	1	2	–	–	–
Lawrence,	78,000	25	11	8	–	1	–	1	–
Somerville,	76,049	12	2	3	2	–	1	–	–
Brockton,	55,039	18	6	9	3	1	–	1	–
Holyoke,	53,590	14	6	6	1	3	–	–	–
Malden,	41,941	14	3	3	2	–	–	–	–
Chelsea,	40,080	16	1	5	1	2	–	–	–
Newton,	39,642	8	3	–	–	–	–	–	–
Salem,	39,019	14	–	2	–	–	–	–	–
Haverhill,	38,362	9	1	3	1	–	–	1	–
Fitchburg,	34,263	11	2	3	2	1	–	–	–
Everett,	33,597	3	–	1	1	–	–	–	–
Quincy,	31,937	4	2	1	1	–	–	–	–
Taunton,	30,967	15	7	3	1	–	–	–	–
Waltham,	28,761	9	1	5	1	1	2	–	–
Pittsfield,	27,932	11	4	2	1	–	1	–	–
Brookline,	26,674	7	1	–	–	–	–	–	–
Gloucester,	26,011	6	1	–	–	–	–	–	–
North Adams,	22,150	2	1	–	–	–	–	–	–
Northampton,	21,075	3	0	1	1	–	–	–	–
Chicopee,	21,049	4	0	1	–	1	–	–	–
Medford,	20,921	2	1	–	–	–	–	–	–
Beverly,	16,386	5	1	1	1	–	–	–	–
Leominster,	16,030	1	–	1	–	1	–	–	–
Hyde Park,	15,609	3	1	1	1	–	–	–	–
Melrose,	15,459	5	2	1	–	–	–	–	–
Newburyport,	14,834	2	2	1	1	–	–	–	–
Revere,	14,820	4	1	–	–	–	–	–	–
Westfield,	14,750	5	3	1	1	–	–	–	–
Woburn,	14,522	7	4	4	–	2	–	–	–
Peabody,	14,512	5	1	–	–	–	–	–	–
Marlborough,	14,456	1	0	–	–	–	–	–	–
Attleborough,	13,913	1	0	–	–	–	–	–	–
Adams,	13,685	1	1	–	–	–	–	–	–
Clinton,	13,105	4	2	2	–	1	1	–	–
Gardner,	13,066	5	2	3	1	–	–	–	–
Milford,	12,722	2	1	1	1	–	–	–	–
Watertown,	12,676	0	–	–	–	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	1	–	–	–	–	–	–	–
Weymouth,	11,798	3	–	1	–	1	–	–	–
Framingham,	11,749	2	0	1	1	–	–	–	–
Wakefield,	11,124	–	–	–	–	–	–	–	–
Webster,	11,109	4	2	3	–	–	–	–	–
Arlington,	10,520	4	–	–	–	–	–	–	–
Greenfield,	10,140	2	0	1	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,405,089	725	225	247	80	45	11	12	–

[1] The populations were estimated upon the rate of growth from 1900 to 1905. Those of Taunton, Gloucester, North Adams and Clinton were allowed to stand as in 1905, having shown no increase during the five-year period. The gain in the population of Lowell is due to the annexation of a part of the town of Tewksbury. The population of Lawrence by the census of 1905 was 70,050, but, owing to the building of the new Wood and Arlington mills, an increase of about 8,000 is estimated by the Lawrence Board of Health, or 78,000.

WEEK ENDING OCT. 8, 1910.

CITIES AND TOWNS.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM—					
				Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	220	72	87	20	22	6	3	–
Worcester,	136,476	41	17	9	5	1	2	–	–
Fall River,	106,486	46	28	21	5	2	–	–	1
Cambridge,	102,112	27	13	14	3	5	1	–	–
Lowell,	96,380	42	20	9	4	2	–	1	–
New Bedford,	85,516	44	22	13	4	6	1	1	–
Lynn,	84,623	23	7	5	4	–	1	–	–
Springfield,	84,237	33	16	11	3	–	1	–	–
Lawrence,	78,000	23	13	11	1	–	–	–	–
Somerville,	76,049	12	2	2	–	2	–	–	–
Brockton,	55,039	16	6	3	2	–	–	–	–
Holyoke,	53,590	13	6	4	–	1	–	–	–
Malden,	41,941	9	5	3	1	1	–	–	–
Chelsea,	40,080	14	4	3	–	1	–	1	–
Newton,	39,642	4	1	–	–	–	–	–	–
Salem,	39,019	10	7	–	–	–	–	–	–
Haverhill,	38,362	13	3	4	–	2	–	1	–
Fitchburg,	34,263	11	6	5	5	–	–	–	–
Everett,	33,597	8	1	2	–	–	1	1	–
Quincy,	31,937	5	2	–	–	–	–	–	–
Taunton,	30,967	22	9	14	5	1	1	1	–
Waltham,	28,761	5	1	3	–	–	–	1	–
Pittsfield,	27,932	14	3	7	3	1	1	–	–
Brookline,	26,674	4	–	1	1	–	–	–	–
Gloucester,	26,011	7	3	1	–	–	1	–	–
North Adams,	22,150	14	4	6	2	–	1	–	–
Northampton,	21,075	8	1	4	–	3	–	–	–
Chicopee,	21,049	6	1	1	1	–	–	–	–
Medford,	20,921	10	2	3	2	–	–	–	–
Beverly,	16,386	7	2	–	–	–	–	–	–
Leominster,	16,030	3	1	1	–	–	1	–	–
Hyde Park,	15,609	4	1	–	–	–	–	–	–
Melrose,	15,459	3	0	–	–	–	–	–	–
Newburyport,	14,834	4	2	–	–	–	–	–	–
Revere,	14,820	6	1	1	–	–	–	–	–
Westfield,	14,750	7	4	2	–	–	2	–	–
Woburn,	14,522	5	2	1	–	–	–	–	–
Peabody,	14,512	5	–	2	2	–	–	–	–
Marlborough,	14,456	5	2	2	–	1	–	–	–
Attleborough,	13,913	5	3	2	–	1	–	–	–
Adams,	13,685	2	2	–	–	–	–	–	–
Clinton,	13,105	3	1	–	–	–	–	–	–
Gardner,	13,066	7	3	2	–	–	–	–	–
Milford,	12,722	6	1	1	–	1	–	–	–
Watertown,	12,676	10	4	2	–	1	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	3	1	2	–	1	–	–	–
Weymouth,	11,798	6	3	–	–	–	–	–	–
Framingham,	11,749	1	–	–	–	–	–	–	–
Wakefield,	11,124	–	–	–	–	–	–	–	–
Webster,	11,109	0	–	–	–	–	–	–	–
Arlington,	10,520	4	–	–	–	–	–	–	–
Greenfield,	10,140	3	1	1	–	1	–	–	–
Recapitulation.									
Total of reporting towns,	2,405,089	803	309	265	73	56	19	10	1

WEEK ENDING OCT. 15, 1910.

CITIES AND TOWNS.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM—					
				Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	205	64	53	2	22	3	2	–
Worcester,	136,476	40	8	12	4	4	1	1	–
Fall River,	106,486	30	12	16	4	3	1	–	1
Cambridge,	102,112	31	7	15	6	6	–	–	–
Lowell,	96,380	40	21	6	3	2	–	–	–
New Bedford,	85,516	26	14	3	2	–	1	–	–
Lynn,	84,623	20	6	5	2	2	–	–	–
Springfield,	84,237	29	5	12	4	2	1	1	–
Lawrence,	78,000	29	10	15	3	1	1	1	–
Somerville,	76,049	9	1	3	–	1	–	–	–
Brockton,	55,039	11	2	3	–	2	–	–	–
Holyoke,	53,590	21	12	11	3	2	–	–	–
Malden,	41,941	5	–	2	2	–	–	–	–
Chelsea,	40,080	11	–	2	–	2	–	–	–
Newton,	39,642	7	5	2	2	–	–	–	–
Salem,	39,019	10	5	3	2	–	–	–	–
Haverhill,	38,362	12	5	4	1	1	–	–	–
Fitchburg,	34,263	10	6	1	–	–	1	–	–
Everett,	33,597	9	6	2	2	–	–	–	–
Quincy,	31,937	3	1	–	–	–	–	–	–
Taunton,	30,967	13	5	8	1	2	3	–	1
Waltham,	28,761	4	1	–	–	–	–	–	–
Pittsfield,	27,932	12	3	3	1	2	–	–	–
Brookline,	26,674	6	–	–	–	–	–	–	–
Gloucester,	26,011	4	–	1	–	–	1	–	–
North Adams,	22,150	6	1	1	–	1	–	–	–
Northampton,	21,075	4	1	2	–	2	–	–	–
Chicopee,	21,049	7	1	–	–	–	–	–	–
Medford,	20,921	3	–	–	–	–	–	–	–
Beverly,	16,386	2	1	–	–	–	–	–	–
Leominster,	16,030	2	–	–	–	–	–	–	–
Hyde Park,	15,609	7	1	2	–	–	–	2	–
Melrose,	15,459	2	0	–	–	–	–	–	–
Newburyport,	14,834	3	2	1	1	–	–	–	–
Revere,	14,820	4	2	2	–	–	–	–	–
Westfield,	14,750	5	2	2	–	1	1	–	–
Woburn,	14,522	3	2	2	2	–	–	–	–
Peabody,	14,512	4	0	2	1	–	–	–	–
Marlborough,	14,456	2	2	1	–	–	–	–	–
Attleborough,	13,913	5	2	1	–	–	–	–	–
Adams,	13,685	0	–	–	–	–	–	–	–
Clinton,	13,105	1	1	–	–	–	–	–	–
Gardner,	13,066	8	6	3	–	–	–	–	–
Milford,	12,722	4	3	1	–	–	1	–	–
Watertown,	12,676	5	0	1	–	–	–	1	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	2	2	1	1	–	–	–	–
Weymouth,	11,798	–	–	–	–	–	–	–	–
Framingham,	11,749	5	2	–	–	–	–	–	–
Wakefield,	11,124	–	–	–	–	–	–	–	–
Webster,	11,109	2	–	–	–	–	–	–	–
Arlington,	10,520	1	–	–	–	–	–	–	–
Greenfield,	10,140	2	–	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,393,291	686	230	204	50	58	15	8	2

WEEK ENDING OCT. 22, 1910.

CITIES AND TOWNS.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	197	66	71	33	17	–	1	–
Worcester,	136,476	37	15	11	3	2	2	1	–
Fall River,	106,486	28	14	15	7	1	–	1	–
Cambridge,	102,112	21	7	8	3	3	–	–	–
Lowell,	96,380	37	15	8	2	–	1	1	–
New Bedford,	85,516	31	11	9	2	–	–	2	–
Lynn,	84,623	19	6	5	3	2	–	–	–
Springfield,	84,237	20	2	3	1	–	–	–	–
Lawrence,	78,000	23	5	8	1	1	1	–	–
Somerville,	76,049	21	4	4	1	3	–	–	–
Brockton,	55,039	20	7	6	1	1	1	–	–
Holyoke,	53,590	19	9	6	4	–	–	1	–
Malden,	41,941	9	2	3	1	1	–	–	–
Chelsea,	40,080	13	4	1	–	1	–	–	–
Newton,	39,642	5	4	–	–	–	–	–	–
Salem,	39,019	11	2	1	–	1	–	–	–
Haverhill,	38,362	10	4	2	1	1	–	–	–
Fitchburg,	34,263	12	5	3	2	1	–	–	–
Everett,	33,597	7	1	–	–	–	–	–	–
Quincy,	31,937	9	3	1	1	–	–	–	–
Taunton,	30,967	11	4	6	2	1	–	–	–
Waltham,	28,761	9	0	3	2	1	–	–	–
Pittsfield,	27,932	1	–	–	–	–	–	–	–
Brookline,	26,674	9	1	–	–	–	–	–	–
Gloucester,	26,011	10	4	–	–	–	–	–	–
North Adams,	22,150	5	1	2	–	–	1	–	–
Northampton,	21,075	8	1	2	2	–	–	–	–
Chicopee,	21,049	5	2	2	–	–	–	1	–
Medford,	20,921	4	–	–	–	–	–	–	–
Beverly,	16,386	5	1	1	–	–	1	–	–
Leominster,	16,030	4	–	1	–	1	–	–	–
Hyde Park,	15,609	3	1	1	1	–	–	–	–
Melrose,	15,459	2	1	–	–	–	–	–	–
Newburyport,	14,834	4	2	4	3	1	–	–	–
Revere,	14,820	2	–	–	–	–	–	–	–
Westfield,	14,750	2	–	1	1	–	–	–	–
Woburn,	14,522	7	1	1	1	–	–	–	–
Peabody,	14,512	2	1	–	–	–	–	–	–
Marlborough,	14,456	3	0	–	–	–	–	–	–
Attleborough,	13,913	3	0	–	–	–	–	–	–
Adams,	13,685	2	1	1	–	–	–	–	–
Clinton,	13,105	3	–	2	2	–	–	–	–
Gardner,	13,066	2	1	1	–	–	–	–	–
Milford,	12,722	2	1	–	–	–	–	–	–
Watertown,	12,676	3	1	–	–	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	2	1	1	–	–	–	–	–
Weymouth,	11,798	–	–	–	–	–	–	–	–
Framingham,	11,749	6	0	1	1	–	–	–	–
Wakefield,	11,124	–	–	–	–	–	–	–	–
Webster,	11,109	6	2	2	1	–	1	–	–
Arlington,	10,520	–	–	–	–	–	–	–	–
Greenfield,	10,140	1	1	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,393,291	693	221	201	85	40	8	8	–

Week ending October 29, 1910.

Cities and Towns.	Population. Estimated for 1909.	Reported Deaths in Each.	Deaths under Five Years.	Deaths from—					
				Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	624,491	203	56	64	25	12	4	–	–
Worcester,	136,476	45	10	12	5	2	–	1	–
Fall River,	106,486	28	14	15	5	2	1	–	–
Cambridge,	102,112	24	7	11	6	2	–	–	–
Lowell,	96,380	36	16	9	4	3	–	1	–
New Bedford,	85,516	30	19	9	5	1	1	–	–
Lynn,	84,623	15	2	–	–	–	–	–	–
Springfield,	84,237	19	5	2	1	–	–	–	–
Lawrence,	78,000	22	8	10	5	–	1	–	–
Somerville,	76,049	16	3	7	3	4	–	–	–
Brockton,	55,039	12	5	4	1	1	1	–	–
Holyoke,	53,590	21	8	9	3	2	–	–	–
Malden,	41,941	8	2	2	–	–	–	–	–
Chelsea,	40,080	13	3	4	3	–	–	–	–
Newton,	39,642	10	3	2	2	–	–	–	–
Salem,	39,019	15	6	3	1	–	1	–	–
Haverhill,	38,362	9	1	3	–	1	1	–	–
Fitchburg,	34,263	7	4	1	–	–	1	–	–
Everett,	33,597	7	1	2	2	–	–	–	–
Quincy,	31,937	4	3	3	2	–	1	–	–
Taunton,	30,967	11	–	2	1	1	–	–	–
Waltham,	28,761	10	1	5	1	2	–	–	–
Pittsfield,	27,932	11	1	3	–	2	–	1	–
Brookline,	26,674	9	0	2	1	1	–	–	–
Gloucester,	26,011	5	1	1	–	1	–	–	–
North Adams,	22,150	7	1	3	1	1	–	–	1
Northampton,	21,075	3	0	–	–	–	–	–	–
Chicopee,	21,049	9	4	2	–	–	1	–	–
Medford,	20,921	2	1	–	–	–	–	–	–
Beverly,	16,386	4	1	–	–	–	–	–	–
Leominster,	16,030	2	1	2	1	1	–	–	–
Hyde Park,	15,609	4	3	2	–	–	1	1	–
Melrose,	15,459	5	0	1	–	1	–	–	–
Newburyport,	14,834	7	–	2	1	1	–	–	–
Revere,	14,820	3	1	1	–	–	–	–	–
Westfield,	14,750	4	1	2	–	2	–	–	–
Woburn,	14,522	2	0	1	–	1	–	–	–
Peabody,	14,512	5	1	1	–	1	–	–	–
Marlborough,	14,456	3	0	–	–	–	–	–	–
Attleborough,	13,913	5	3	1	–	–	–	–	–
Adams,	13,685	3	1	3	1	2	–	–	–
Clinton,	13,105	3	1	–	–	–	–	–	–
Gardner,	13,066	6	3	4	4	–	–	–	–
Milford,	12,722	5	0	2	–	2	–	–	–
Watertown,	12,676	2	2	1	1	–	–	–	–
Plymouth,	12,514	–	–	–	–	–	–	–	–
Southbridge,	11,848	6	2	2	1	–	–	–	–
Weymouth,	11,798	–	–	–	–	–	–	–	–
Framingham,	11,749	1	0	1	–	1	–	–	–
Wakefield,	11,124	–	–	–	–	–	–	–	–
Webster,	11,109	5	2	4	1	1	–	–	–
Arlington,	10,520	6	–	–	–	–	–	–	–
Greenfield,	10,140	3	2	1	–	–	1	–	–
Recapitulation.									
Total of reporting towns,	2,393,291	695	209	221	87	51	15	4	1

WEEKLY RETURNS OF DEATHS FROM CERTAIN INFECTIOUS DISEASES.

DEATHS FROM INFECTIOUS DISEASES NOT SPECIFICALLY MENTIONED IN ABOVE TABLES DURING THE WEEKS OF OCTOBER 1, 8, 15, 22 AND 29, 1910.

DISEASE.	Place.	WEEK ENDING—				
		Oct. 1.	Oct. 8.	Oct. 15.	Oct. 22.	Oct. 29.
Cerebro-spinal meningitis,	Boston,	1	1	–	–	–
	Brockton,	–	–	–	1	–
	Cambridge,	–	–	2	–	–
	New Bedford,	–	–	–	1	–
	Worcester,	–	–	–	–	1
Scarlet fever,	Boston,	–	1	–	–	1
	North Adams,	–	2	–	–	–
	Salem,	1	–	–	–	1
	Woburn,	–	1	–	–	–
Whooping cough,	Boston,	–	2	2	1	2
	Cambridge,	–	1	–	–	–
	Fall River,	–	1	–	1	–
	Lowell,	–	1	–	–	–
	Lynn,	–	–	1	–	–
	Waltham,	–	–	–	–	1
	Woburn,	1	–	–	–	–
	Worcester,	–	–	–	2	–
Erysipelas,	Boston,	–	–	1	–	–
	Taunton,	–	1	–	–	–
Tuberculosis other than pulmonary.	Attleborough,	–	1	–	–	–
	Boston,	3	5	3	1	3
	Brockton,	1	–	–	–	1
	Cambridge,	2	1	–	–	–
	Chelsea,	2	–	–	–	–
	Fall River,	2	–	1	–	1
	Haverhill,	–	–	–	–	1
	Holyoke,	–	–	1	–	–
	Lawrence,	–	2	1	–	–
	Lowell,	1	–	–	1	1
	New Bedford,	1	1	–	1	–
	Northampton,	–	1	–	–	–
	Peabody,	–	–	1	–	–
	Pittsfield,	–	1	–	–	–
	Revere,	–	–	1	–	–
	Salem,	1	–	1	–	–
	Springfield,	1	1	1	–	–
	Waltham,	–	1	–	–	–
	Worcester,	1	–	1	–	3
Meningitis other than cerebro-spinal.	Greenfield,	1	–	–	–	–
	Brockton,	–	–	–	2	–
	Malden,	–	–	–	–	1
	Watertown,	–	1	–	–	–

DEATHS FROM INFECTIOUS DISEASES, ETC. — *Concluded.*

DISEASE.	Place.	WEEK ENDING — Oct. 1.	Oct. 8.	Oct. 15.	Oct. 22.	Oct. 29.
Tetanus,	Brockton,	1	–	–	–	–
	Springfield,	1	1	–	–	–
	Waltham,	1	–	–	–	–
Anterior poliomyelitis,	Attleborough,	–	–	–	–	1
	Boston,	–	3	–	–	–
	Malden,	–	–	–	–	1
	Melrose,	1	–	–	–	–
	New Bedford,	2	–	–	–	–
	Springfield,	1	1	–	–	–
	Taunton,	1	1	–	2	–
Influenza,	Cambridge,	–	–	–	–	1
	Lowell,	–	–	–	1	–
	Springfield,	–	–	1	–	–
	Webster,	–	–	–	–	1

WEEKLY RETURNS OF CASES OF INFECTIOUS DISEASES.

CASES OF INFECTIOUS DISEASES REPORTED DURING THE WEEKS OF OCTOBER 1, 8, 15, 22 AND 29, 1910.

[Under the provisions of section 52 of chapter 75 of the Revised Laws.]

	WEEK ENDING — Oct. 1.	Oct. 8.	Oct. 15.	Oct. 22.	Oct. 29.	Total.
Diphtheria,	138	150	126	136	162	712
Measles,	22	47	33	65	48	215
Scarlet fever,	108	124	74	84	90	480
Typhoid fever,	99	129	139	121	86	574
Tuberculosis, pulmonary,	87	135	99	120	106	547
Tuberculosis other than pulmonary,	2	1	4	1	–	8
Cerebro-spinal meningitis,	2	4	4	4	2	16
Meningitis other than cerebro-spinal,	–	–	1	–	1	2
Whooping cough,	18	19	28	39	17	121
Varicella,	5	14	23	42	27	111
Erysipelas,[1]	1	–	–	–	–	1
Mumps,[1]	2	–	2	2	2	8
Ophthalmia neonatorum,	3	5	4	3	8	23
Anterior poliomyelitis,	31	36	31	32	10	140
Tetanus,	3	2	–	–	1	6
Actinomycosis,	–	–	–	1	–	1
Malaria,	2	–	–	–	–	2
Glanders,	–	1	–	–	–	1

[1] Erysipelas and mumps are not diseases notifiable under section 52 of chapter 75 of the Revised Laws. The figures concerning these diseases are, therefore, incomplete.

MONTHLY REPORT ON INSPECTION OF FOOD AND DRUGS.

The following summary presents the results of the examination of food and drugs made by the State Board of Health during the month of October, 1910: —

Articles examined.	Number found to be of Good Quality.	Number adulterated or varying from the Legal Standard.	Total.	Articles examined.	Number found to be of Good Quality.	Number adulterated or varying from the Legal Standard.	Total.
Butter,	3	–	3	Honey,	1	–	1
Canned fish,	3	1	4	Maple syrup,	–	1	1
Canned fruit, and vegetables,	3	1	4	Meat products: —			
Cheese,	2	–	2	Hamburg steak,	1	–	1
Cider,	8	2	10	Pigs' feet,	1	–	1
Cocoa,	1	–	1	Sausages,	4	2	6
Coffee,	1	–	1	Tongue cheese,	1	–	1
Condensed milk,	1	–	1	Milk,	397	106	503
Confectionery,	1	–	1	Olive oil,	1	–	1
Cream,	6	1	7	Pastry,	2	1	3
Dried fruits,	1	–	1	Peanut butter,	1	–	1
Drugs,	42	14	56	Peanuts,	–	1	1
Flavoring extracts (vanilla),	4	–	4	Spices,	1	–	1
Fruit juice,	1	–	1	Table sauce,	2	–	2
				Total,	489	130	619

The samples of drugs found to be adulterated were: cocaine, hydrochlorate, camphor liniment, morphine pills, spirit of peppermint, tincture of iodine, mercurial ointment and several proprietary medicines.

The cities and towns in which samples were collected were: Belmont, Beverly, Boston, Brockton, Cambridge, Chelmsford, Chelsea, Dalton, Danvers, Duxbury, Gloucester, Halifax, Hingham, Holyoke, Hopedale, Hudson, Kingston, Lanesborough, Lawrence, Lee, Lenox, Lowell, Lynn, Malden, Medfield, Melrose, Milford, New Bedford, Newburyport, Pittsfield, Plymouth, Quincy, Rockport, Salem, Somerville, Springfield, Taunton, Topsfield, Wakefield, Wellesley, Wenham, Weymouth, Whitman and Worcester.

PROSECUTIONS FOR VIOLATIONS OF THE LAW RELATING TO FOOD AND DRUGS.

Twenty-five convictions were secured during the month of October, 1910, for selling adulterated food, as follows: —

No.	Name of Defendant.	Place.	Character of Article sold.
1	Thomas W. Cole,	Gloucester,	Milk (total solids, 11.05).[1]
2	John M. Cunningham,	Malden,	Milk (total solids, 11.52).[1]
3	Lemuel Friend, Jr.,	Gloucester,	Milk (total solids, 10.60).[1]
4	Harvey W. Forbes,	Melrose,	Milk (total solids, 11.68).
5	Gloucester Dairy Company,	Gloucester,	Milk (total solids, 10.00).[1]
6	George F. Knapp,	Quincy,	Milk (total solids, –).[2]
7	William G. Lane,	Gloucester,	Milk (total solids, 11.58).[1]
8	James A. Lawrence,	Gloucester,	Milk (total solids, 11.30).[1]
9	James A. Lawrence,	Gloucester,	Milk (total solids, 7.88).[1]
10	John P. Madruga,	Gloucester,	Milk (total solids, 10.56).[2]
11	Mrs. Phillippa Madruga,	Gloucester,	Milk (total solids, 11.50).
12	William C. Mackintosh,	Newburyport,	Milk (total solids, 7.85).[1]
13	John McLaughlin,	Brockton,	Milk (total solids, 11.80).[2]
14	John McLaughlin,	Brockton,	Milk (total solids, 11.80).
15	John C. Moynihan,	Newburyport,	Milk (total solids, 11.36).
16	William Nelson,	Lynn,	Milk (total solids, 12.00).[1]
17	E. E. Nichols,	Malden,	Milk (total solids, 11.82).
18	E. E. Nichols,	Malden,	Cream, F. 12.4
19	Chas. J. Neugent,	Rockport,	Milk (total solids, 11.40).[1]
20	George Pawsey,	Quincy,	Milk (total solids, 10.28).[2]
21	Ernest M. Shute,	Malden,	Milk (total solids, 11.75).
22	Julia H. Tracy,	Quincy,	Milk (total solids, 10.79).[1]
23	George E. Waldron,	Gloucester,	Milk (total solids, –).
24	Harry Cohen,	Brockton,	Peanuts, decomposed.
25	James P. Galligan Company,	Taunton,	Vinegar.

[1] Watered. [2] Skimmed.

Fines imposed, $785.

LIST OF ADULTERATED OR IMPROPERLY LABELED FOODS, ETC., FOR OCTOBER, 1910.

Number of Sample.	Character of Sample.	Name of Manufacturer, Wholesaler or Producer.	Results of Analyses.
13089	Condensed tomato soup,	The Tip Top Ketchup Company, Cincinnati, O.,	Contained benzoic acid.
A 453	Equalizing drops,	Drs. Carpenter, Lowell, Mass.,	Contained 60.1 per cent. alcohol by volume.
13165	Clayton & Russell's Standard Wild Cherry Cordial,	Adams & Co., New York,	Contained 18.88 per cent. alcohol by volume.
6852 N	Sun cholera mixture,	Markell Weston Drug Company,	Contained 19.28 per cent. alcohol by volume.
6716 N	Cholera mixture,	Norris, Druggist, Boston, Mass.,	Contained 56.40 per cent. alcohol by volume.
13046	Milk,	John McLaughlin, Brockton, Mass.,	Total solids, 11.80 per cent.; fat, 2.90 per cent.; proteid, 3.31 per cent.; skimmed milk.
q 5852	Milk,	Hiram Miller, Milford, Mass.,	Total solids, 12.28 per cent.; fat, 3.05 per cent.; proteid, 3.52 per cent.; skimmed milk.
13077	Milk,	Charles Meuse, East Weymouth, Mass.,	Total solids, 11.40 per cent.; fat, 4.00 per cent.; contained added water.
13079			Total solids, 11.46 per cent.; fat, 3.50 per cent.; contained added water.
6640 N	Milk,	William G. Lane, West Gloucester, Mass.,	Total solids, 11.58 per cent.; fat, 3.50 per cent.; contained added water.
6648 N			Total solids, 12.00 per cent.; fat, 4.10 per cent.; contained added water.
q 5751	Milk,	Eben B. Kenerson, Lynn, Mass.,	Total solids, 10.80 per cent.; fat, 4.20 per cent.; contained added water.
6754 N	Milk,	William E. Shockly, Bryantville, Mass.,	Total solids, 10.57 per cent.; fat, 4.80 per cent.; contained added water.
6756 N			Total solids, 11.14 per cent.; fat, 4.30 per cent.; contained added water.
6758 N			Total solids, 9.48 per cent.; fat, 3.20 per cent.; contained added water.

FANCY CRACKERS, ETC., CONDEMNED.

A lot of goods sold by the Union Biscuit Company, 100 North Street, Boston, to Abraham Lowe & Son of Chelsea, and later attached by the seller, consisting of 50 cases of fancy crackers, 15 cases of "marshmallow sandwiches" and 7 cases of cocoanut cakes, was condemned by an inspector on October 19, said goods being decomposed to a certain extent and therefore adulterated under the law. Value, $100.

INSPECTION OF DAIRIES.

During the month of October, 1910, 129 dairies were examined in the following places: —

Place.	Number examined.	Number found to present no Objectionable Features	Per Cent.	Number concerning which Letters were sent.	Per Cent.
Alford,	12	4	33.33	8	66.67
Egremont,	16	3	18.75	13	81.25
Great Barrington,	36	15	41.67	21	58.33
Hyde Park,	10	2	20.00	8	80.00
Second inspection,	2	1	50.00	1	50.00
Monterey,	1	1	100.00	–	–
Needham,	8	4	50.00	4	50.00
Second inspection,	11	7	63.64	4	36.36
Third inspection,	1	1	100.00	–	–
Sheffield,	6	2	33.33	4	66.67
Sudbury,	–	–	–	–	–
Second inspection,	1	–	–	1	100.00
Third inspection,	7	5	71.43	2	28.57
Fourth inspection,	4	4	100.00	–	–
Winchester,	2	2	100.00	–	–
Second inspection,	11	7	63.64	4	36.36
Third inspection,	1	1	100.00	–	–

Total number of dairies examined,	129
Number found to be free from objectionable conditions,	59
Number concerning which letters were sent,	70
Total number of conditions to which attention was called,	188
Percentage of dairies which passed inspection,	45.74

In addition to the above, 20 dairies were visited at which the sale of milk had been discontinued.

The names of the owners of the dairies found to be worthy of commendation follow: —

ALFORD.

Class B.

Dellea, G. Dellea, L. C. Morandi, S.
Osborne, L. T.

EGREMONT.

Class B.

Brussie, J. O. Burtiss, W. B. Phillips, Alonzo

Great Barrington.

Class B.

Adams, P. I.
Baldwin, C. W.
Brown, Estate of W. L.
Freehan, C. W.
Hall, Oscar M.
Hatch, J. W.
Hattie, Vincent
Juggler, Anthony
Mangion, Michael
Miller, Henry
Pendergast, Michael
Read, Charles
Shaw. E. D.
Silvernail, A.
Warner, W. J.

Hyde Park.

Class B.

Fardy, Wilfred W.
Koflosky, Peter *
Wyman, Adrian A.

Monterey.

Class B.

Hammer, Leonard

Needham.

Class A.

Walker-Gordon Co.‡
Whitaker, Mrs. A.*†

Class B.

Bezanson, E. F.
Brown, C.*
Crowley, William *
Dallachie, James
Eaton, Harris *
Kennedy, Robert
Matkerney, Peter
Tilton, J. A.*
Tuck, G. R.*†
Wills, George*†

Sheffield.

Class B.

Curtis, R. A.
Smith, James

Sudbury.

Class A.

Wright, Charles A.§

Class B.

Amos Bros.§
Carrigan, M. T.‡
Clark, Fred ‡
Fairbanks, W. H.‡
Ham, Frederick §
O'Neil, Thomas ‡
Perkins, N. H. §
Sudbury Town Farm ‡

Winchester.

Class A.

Thompson, Stephen *†

Class B.

Cullan, Mrs. J.*
Flynn, Michael J.*
Marshall, J. F.*
Morton, Mrs. Louise A.
Nelson, Michael S.‡
Quigley, John
Richardson, A. E.*
Swan, John *
Symmes, Marshall *

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* Second inspection.
† Reported favorably on first inspection.
‡ Third inspection.
§ Fourth inspection.

THE DETECTION OF ADDED WATER IN MILK.

By Hermann C. Lythgoe, *Analyst of the Board.*

The detection of added water in milk depends upon being able to show abnormal chemical or physical constants which can be explained only by the addition of water, there being no test which will distinguish between the water which may be added to the milk and the water naturally present. It is incumbent, therefore, upon persons engaged in the chemical examination of milk to become familiar with the chemical and physical properties of milk of known purity.

A study of the published analyses of milk shows an extreme variance, yet if we study the methods of analysis in connection with the figures, a great deal may be explained by incorrectness of the methods then in use. It is the opinion of the writer that all milk completely drawn from healthy cows will vary between the following limits: —

Table I.

	Extreme Limits (Per Cent.).	Usual Limits (Per Cent.).	Herd Milk (Per Cent.).
Total solids,	10.0–17.0	10.5–16.0	11.8–15.0
Fat,	2.2– 9.0	2.8– 7.0	3.2– 6.0
Proteins,	2.1– 8.5	2.5– 4.5	2.5– 4.0
Ash,	0.6– 0.9	0.7– 0.8	0.7– 8.0
Solids not fat,	7.5–11.0	7.7–10.0	8.0– 9.5
Milk sugar,	4.0– 6.0	4.2– 5.5	4.3– 5.3

If we depend upon the solids, fat or proteins to indicate added water, it is evident that considerable adulterated milk will escape detection, but if a minimum figure is employed for ash, solids not fat or sugar, more adulterated milk will be discovered. The most successful methods for the detection of added water, such as the constants of the serum or the acidity of the sour milk, are based upon the milk sugar content.

In the routine examination of milk it is most feasible to first eliminate the good samples and then pay attention to the suspicious ones. For this purpose the writer has devised a simple process, depending upon the indirect calculation of the milk sugar from the solids and the fat, regarding all samples showing from 4.2 to 4.8 per cent. sugar as normal milk. Van Slyke has shown [1] that a relation exists between the fat

[1] Jour. Am. Chem. Soc., 30, 1166.

and proteins of milk, and if one is known the other may be approximately calculated by the following formula: —

$$0.4(F.—3) + 2.8 = P.$$

Olson has shown [1] that a relation exists between the solids and the proteins, which may be expressed as follows: —

$$T.S.—\frac{T.S.}{1.34} = P.$$

These two formulæ give nearly the same results with pure milk, but with adulterated milk the figures do not agree, the difference increasing with the adulteration, and in the case of skimmed milk the values for the proteins are too low. Using these formulæ in the indirect calculation of the milk sugar, we assume an ash content of 0.7 per cent., and substitute the values for the total solids and fat in the following formulæ: —

$$\text{Milk sugar} = T.S.—(F. + [0.4(F—3) + 2.8] + 0.7)$$

$$\text{Milk sugar} = T.S.—\left(F. + \left[T.S.—\frac{T.S.}{1.34}\right] + 0.7\right)$$

If the sample has been skimmed the calculated proteins will be low, and consequently the calculated sugar will be too high, exceeding 4.8 per cent., but if the sample has been watered the calculated sugar will be less than 4.2 per cent., and in either case special tests should be made. A table has been made by these methods of calculation for all solids figures between 10.5 per cent. and 14 per cent. and for fat figures between 2 per cent. and 5.2 per cent., and from these results the following table has been prepared, showing the range of fat and solids not fat in pure milk varying from 10.5 to 14 per cent. in solids. If the fat is higher than that stated in the table, the milk may be watered; if lower, it may be skimmed, the difference increasing with the adulteration. It should be stated that a sample which has been both skimmed and watered in the proper proportion may fall in the class of good milk.

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[1] Jour. Ind. and Eng. Chem. 1, 256.

TABLE II. — *Composition of Milk probably not adulterated.*

Total Solids (Per Cent.).	Fat (Per Cent.).		Solids not Fat (Per Cent.).		Total Solids (Per Cent.).	Fat (Per Cent.).		Solids not Fat (Per Cent.).	
	Minimum (Per Cent.).	Maximum (Per Cent.).	Minimum (Per Cent.).	Maximum (Per Cent.).		Minimum (Per Cent.).	Maximum (Per Cent.).	Minimum (Per Cent.).	Maximum (Per Cent.).
10.5	2.5	2.7	7.8	8.0	12.3	3.7	4.0	8.3	8.6
10.6	2.5	2.8	7.8	8.1	12.4	3.7	4.1	8.3	8.7
10.7	2.6	2.9	7.8	8.1	12.5	3.8	4.1	8.4	8.7
10.8	2.6	3.0	7.8	8.2	12.6	3.9	4.2	8.4	8.7
10.9	2.7	3.0	7.9	8.2	12.7	3.9	4.2	8.5	8.8
11 0	2.8	3.1	7.9	8.2	12.8	4.0	4.3	8.5	8.8
11.1	2.8	3.2	7.9	8.3	12.9	4.1	4.4	8.5	8.8
11.2	2.9	3.2	8.0	8.3	13.0	4.1	4.5	8.5	8.9
11.3	3.0	3.3	8.0	8.3	13.1	4.2	4.5	8.6	8.9
11.4	3.1	3.4	8.0	8.3	13.2	4.2	4.6	8.6	9.0
11.5	3.1	3.5	8.0	8.4	13.3	4.3	4.6	8.7	9.0
11.6	3.2	3.5	8.1	8.4	13.4	4.3	4.7	8.7	9.1
11 7	3.3	3.6	8.1	8.4	13.5	4.4	4.8	8.7	9.1
11.8	3.3	3.7	8.1	8.5	13.6	4.5	4.8	8.8	9.1
11.9	3.4	3.7	8.2	8.5	13.7	4.5	4.9	8.8	9.2
12.0	3.5	3.8	8.2	8.5	13.8	4.6	5.0	8.8	9.2
12.1	3.5	3.9	8.2	8.6	13.9	4.7	5.0	8.9	9.2
12.2	3.6	3.9	8.3	8.6	14.0	4.8	5.1	8.9	9.2

Table III. gives the analyses of 33 samples of known purity milk from individual cows, and of 4 samples of herd milk. Nearly all the cows had calved shortly before taking the samples, and gave a heavy flow of milk, yet only one-third of the samples were below the legal standard. In collecting the samples, milk was taken from the heaviest milkers, with a view of getting a large proportion of low-grade milk, so as to determine the minimum constants of milk serum other than the refraction. It should be noted that none of the milk could be called exceptionally high grade, as samples were not collected from Jersey or Guernsey cows.

Detection of Skimmed Milk.

If the fat is less than 2.2 per cent. the sample may be declared skimmed without any further examination, other than the determination of total solids, if the solids not fat are above 8.5 per cent. If the fat is between 2.2 per cent. and 3.5 per cent. a determination of total organic nitrogen should be made, from which the proteins are calculated by the factor 6.38, and if the proteins exceed the fat the sample is skimmed. If the fat is above 3.5 per cent. skimming cannot be detected by a nitrogen determination, as the proteins are rarely as high as 3.5 per cent. In these cases it is necessary to rely upon the high gravity, high solids not fat and the correspondingly low fat.

TABLE III.—*Analyses of Milk of Known Purity.*

BREED.	Time since Calving (Mos.).	Weight of Milk (Lbs.).	Specific Gravity, 15°.	Total Solids (Per Cent.).	Fat (Per Cent.).	Proteins (Per Cent.).	Ash (Per Cent.).	Solids not Fat (Per Cent.).	Sugar (Per Cent.).	COPPER SERUM.				NATURAL SOUR SERUM.		
										Refraction, 20°.	Specific Gravity, $\frac{20°}{4°}$	Solids (Per Cent.).	Sugar (Per Cent.).	Refraction, 20°.	Specific Gravity, $\frac{20°}{4°}$	Ash (Per Cent.).
Grade Durham,	2	15	1.035	14.58	5.10	3.35	0.81	9.48	5.00	39.7	1.0280	6.28	4.43	44.4	1.0292	0.768
Holstein,	2	15	1.034	13.65	4.50	3.33	0.72	9.15	4.95	38.4	1.0271	6.05	4.54	43.0	1.0273	0.776
Grade Durham,	2	16	1.036	13.52	4.00	3.54	0.72	9.52	5.20	38.9	1.0272	6.09	4.38	43.0	–	–
Grade,	1	20	1.033	13.36	4.30	3.25	0.81	9.06	5.00	38.3	1.0270	5.96	4.63	42.0	1.0279	0.816
Grade,	4	18	1.034	13.30	4.00	3.54	0.76	9.30	5.00	38.7	1.0269	6.07	4.56	43.1	1.0280	0.830
Holstein,	5	10	1.032	13.29	4.40	3.14	0.70	8.89	4.70	38.8	1.0275	6.10	4.34	42.2	1.0265	0.784
Grade Durham,	2	15	1.034	13.27	4.00	3.36	0.78	9.00	5.40	39.2	1.0282	6.20	4.50	43.3	–	–
Grade Ayrshire,	1	12	1.033	13.26	4.20	2.84	0.66	9.06	5.50	39.7	1.0281	6.39	4.78	43.9	1.0286	0.750
Grade Swiss,	2	16	1.033	13.20	4.35	3.29	0.76	8.85	4.75	37.6	1.0261	5.86	4.48	40.8	1.0259	0.788
Grade Durham,	2	15	1.033	13.06	3.80	3.37	0.69	9.26	5.75	38.6	1.0271	6.05	4.82	42.4	1.0274	0.750
Grade Durham,	2	16	1.034	13.02	4.10	3.01	0.80	8.92	5.30	39.3	1.0277	6.19	4.47	43.1	1.0286	0.769
Ayrshire,	9	10	1.031	12.91	3.90	3.51	0.76	9.01	4.35	37.3	1.0259	5.73	3.94	41.0	1.0254	0.846
Grade Ayrshire,	2	21	1.031	12.85	4.30	3.15	0.68	8.55	5.20	37.1	1.0259	5.66	4.40	39.9	1.0254	0.760
Grade Holstein,	2	17	1.032	12.78	4.00	2.89	0.71	8.78	5.05	38.0	1.0274	6.07	4.40	42.1	1.0272	0.768
Grade Holstein,	2	18	1.032	12.78	4.00	2.89	0.69	8.78	4.90	38.5	1.0271	6.05	4.40	42.2	1.0269	0.772
Holstein,	6	10	1.031	12.66	3.90	2.97	0.76	8.76	4.35	37.6	1.0268	5.85	4.21	41.8	1.0266	0.820
Grade Holstein,	2	20	1.032	12.64	3.80	3.01	0.62	8.84	5.15	38.7	1.0273	6.11	4.71	41.9	1.0270	0.744
Grade Durham,	2	18	1.035	12.58	3.70	3.12	0.74	8.88	5.00	38.4	1.0269	5.93	–	41.9	1.0271	0.741
Grade Durham,	2	18	1.034	12.54	3.50	2.97	0.68	9.04	5.25	38.8	1.0274	6.06	4.14	42.7	–	–
Grade Durham.	2	15	1.033	12.50	3.30	3.08	0.74	9.00	5.05	38.6	1.0271	6.03	4.14	42.7	–	–
Holstein,	4	16	1.031	12.29	3.80	2.65	0.72	8.49	4.85	37.7	1.0266	5.87	4.38	41.8	1.0264	0.755
Holstein,	1	10	1.033	12.27	3.40	3.27	0.84	8.87	4.60	37.6	1.0264	5.82	4.11	41.2	1.0259	0.868
Grade Holstein,	8	18	1.032	12.12	3.50	3.32	0.74	8.62	4.40	37.5	1.0258	5.75	4.25	41.4	1.0262	0.780
Grade Ayrshire,	3	16	1.032	12.08	3.70	2.80	0.78	8.38	4.65	37.0	1.0259	5.70	4.33	40.6	1.0249	0.804
Grade Holstein,	4	20	1.032	12.03	3.45	2.89	0.72	8.58	5.00	38.6	1.0273	6.09	4.43	42.1	1.0270	0.800
Grade Holstein,	1	20	1.034	12.00	3.10	2.99	0.71	8.90	5.05	38.4	1.0271	6.07	4.61	41.5	1.0270	0.780
Grade Holstein,	4	16	1.030	11.77	3.70	2.67	0.71	8.07	4.50	37.2	1.0261	5.79	4.30	39.7	1.0248	0.740
Holstein,	½	18	1.033	11.40	3.20	2.48	0.72	8.20	5.00	37.5	1.0261	5.75	4.22	41.0	1.0258	0.800
Holstein,	7	15	1.031	11.27	3.15	3.09	0.78	8.12	4.30	36.6	1.0253	5.47	3.73	39.7	1.0244	0.804
Holstein,	10	18	1.031	11.21	3.35	2.81	0.75	7.86	4.30	36.3	1.0250	5.37	3.88	38.7	1.0239	0.792
Holstein,	3	20	1.031	11.48	3.40	2.78	0.80	8.08	4.50	36.8	1.0256	5.53	4.02	40.6	1.0255	0.800
Grade Holstein,	4	16	1.030	10.66	2.85	2.66	0.65	7.81	4.40	36.4	1.0254	5.51	4.22	39.1	1.0242	0.740
Holstein,	1	28	1.030	10.20	2.65	2.40	0.65	7.55	4.50	36.5	1.0256	5.45	3.76	38.6	1.0234	0.735
Mixed milk,[1]	–	–	1.033	13.40	4.20	3.13	0.70	9.20	5.10	38.5	1.0269	6 05	4.09	42.2	1.0272	0.780
Mixed milk,[2]	–	–	1.033	13.08	4.10	3.23	0.76	8.98	4.65	37.7	1.0262	5.84	4.34	41.3	1.0259	0.788
Mixed milk,[3]	–	–	1.033	12.73	3.80	3.33	0.71	8.93	4.70	38.0	1.0261	5.94	4.22	41.4	1.0272	0.768
Mixed milk,[4]	–	–	1.032	12.53	3.70	3.35	0.73	8.83	4.75	37.7	1.0259	5.77	4.28	41.5	1.0261	0.808

[1] Grade Ayrshire, Durham, Shorthorn and Holstein cows.

[2] Grade Jersey, Ayrshire and Holstein cows.

[3] Grade Holstein and Grade Jersey cows.

[4] Holstein, Grade Holstein and Grade Jersey cows.

Detection of Added Water.

For the detection of added water in milk it is usual to prepare a milk serum, because the most variable constituents (the fat and the proteins) remain in the curd, while the serum will contain the sugar and the ash, which are the least variable. The serum may be prepared by allowing

Table IV. — *Partial Analyses of Known Purity Milk from Individual Cows.*

Total Solids (Per Cent.).	Fat (Per Cent.).	Solids not Fat (Per Cent.).	Ash (Per Cent.).	Copper Serum Refraction.	Natural Sour Serum.	
					Refraction.	Ash (Per Cent.).
13.32	3.90	9.42	0.84	37.1	42.7	0.896
13.10	4.40	8.70	0.74	36.1	40.4	0.846
12.70	3.60	9.10	0.80	38.0	42.5	0.871
12.56	3.40	9.16	0.70	37.7	41.0	0.777
12.54	3.70	8.84	0.67	36.7	40.1	0.820
12.37	3.40	8.97	0.71	37.4	41.2	0.820
12.32	3.60	8.72	0.80	37.4	40.9	0.876
12.27	3.80	8.47	0.70	36.6	40.0	0.784
12.12	3.40	8.72	0.70	37.3	42.3	0.824
12.10	3.75	8.35	0.74	36.1	40.8	0.780
12.02	3.65	8.37	0.74	36.3	40.8	0.824
12.00	3.50	8.50	0.84	36.0	40.5	0.908
11.99	3.30	8.69	0.67	37.1	43.4	0.780
11.84	3.55	8.29	0.74	36.0	39.7	0.873
11.77	3.00	8.77	0.80	37.1	42.3	0.780
11.60	2.75	8.85	0.80	37.3	43.1	0.840
11.58	3.40	8.18	0.78	36.0	39.4	0.764
11.30	3.00	8.30	0.70	37.1	40.2	0.767
10.81	3.20	7.61	0.74	36.7	38.8	0.780
10.76	3.00	7.76	0.72	36.9	38.7	0.760
10.76	2.90	7.86	0.72	37.7	41.2	0.780

the sample to sour spontaneously, by heating with acetic acid or calcium chloride, or by treating in the cold with asaprol citric acid solution or copper sulphate. The copper sulphate method is preferred by the writer, and is as follows: —

Dissolve 72.5 grains of crystallized copper sulphate in water and dilute to 1 liter. This solution should be adjusted, if necessary, so that it will refract at 36 on the scale of the Zeiss immersion refractometer at 20° C., or have a specific gravity of 1.0443 at 20° C., compared with water at 4° C. To one volume of the copper solution add four volumes of sweet milk, shake well and filter. The filtrate will usually be clear after the first few drops have passed through. A determination of the refraction, specific gravity or solids may be made upon the clear serum, and if below the minimum for pure milk the sample may be declared watered.

If the sample is sour it should be filtered and determinations of refraction, specific gravity or ash made upon the serum.

It is not necessary to possess a refractometer in order to examine milk serum; in fact, it is a waste of money to purchase one if it is to be used

for no other purpose, or unless so many samples are to be examined each day that the saving in time would more than offset the price. The specific refraction of the copper serum $\frac{n^2-1}{n^2+2} \cdot \frac{1}{d}$ is not exactly a constant, decreasing slightly as the refraction grows less, but it is sufficiently uniform for refraction values between 34 and 38, that if we know the refraction at 20° we may calculate the specific gravity at 20° compared with water at 4° by the formula —

$$\frac{n^2-1}{n^2+2} \cdot \frac{1}{d\frac{20}{4}} = 0.20526.$$

The value of n_D corresponding to the scale reading of 36 on the immersion refractometer is 1.34124. Substituting in the above formula we find that $d\frac{20^\circ}{4^\circ} = 1.0245$; therefore, if a refraction less than 36 indicates added water, the same may be said of a specific gravity less than 1.0245 at 20° C. referred to water at 4° C.

The relation between the refraction and gravity of the serum from spontaneously soured milk is expressed by the formula —

$$\frac{n^2-1}{n^2+2} \cdot \frac{1}{d\frac{20^\circ}{4^\circ}} = 0.20607.$$

As 38.3 [1] represents the lowest refraction at 20° C., the lowest gravity at $\frac{20^\circ}{4^\circ}$ C is 1.0229.

The total solids of the copper serum bears a relation to the refraction, and it has been found from plotting the figures in Table III. that the lowest solids in the copper serum corresponding to a refraction of 36 is 5.28 per cent.; therefore, if the solids are less than this, added water is indicated.

The ash of the sour serum is useful to substantiate the presence of added water, but as a rule it will be above the minimum figure unless the adulteration exceeds 12 per cent. To determine the ash of the sour serum, place 25 cubic centimeters of the serum in a platinum milk dish and evaporate to dryness, heat the residue in a muffle at a low red heat until thoroughly charred, cool, treat with a little water, dry over the steam bath and again ignite as before, when the carbon will usually burn very quickly; cool, dry and weigh. The lowest ash found is 0.738 per cent.

The Influence of Added Water upon the Composition of Milk.

For the purpose of studying the influence of added water upon milk a sample of milk above the average in solids not fat and refraction was

[1] Lowest of 125 known purity samples.

obtained and to this sample water was added in varying amounts. The samples were then analyzed and the results appear in Table V.

TABLE V. — *Composition of a Sample of Milk systematically watered.*

Added Water (Per Cent.).	Solids (Per Cent.).	Fat (Per Cent.).	Solids not Fat (Per Cent.).	Copper Serum.			
				Refraction, 20°.	Specific Gravity, $\frac{20°}{4°}$	$\frac{n^2-1}{n^2+2} \cdot \frac{1}{d}$	Solids (Per Cent.).
0	13.18	4.20	8.98	38.5	1.0272	0.20529	6.09
10	11.86	3.78	8.08	36.4	1.0249	0.20526	5.57
20	10.54	3.36	7.18	34.4	1.0233	0.20523	5.05
30	9.23	2.94	6.29	32.4	1.0211	0.20520	4.56
40	7.91	2.52	5.39	30.6	1.0194	0.20518	4.10
50	6.59	2.10	4.49	28.6	1.0174	0.20516	3.54

A study of the above table shows that each 5 per cent. of added water lowers the refraction by one scale division, and, therefore, in order to detect 10 per cent. of added water in milk the milk before watering must give a serum refracting below 38. The question now arises as to what are the probabilities of this happening. Of 221 samples of known purity milk 124, or 56 per cent., gave sera refracting below 38, and of these same samples 107, or 48 per cent., were below 12.78 per cent. in total solids, and 114, or 51 per cent., were below 8.77 per cent. in solids not fat. The average of the samples of milk collected by the State Board of Health in 1909, exclusive of samples which could be declared skimmed, watered or cream, was 12.78 per cent. in solids and 8.77 per cent. in solids not fat. It is fair to presume from these figures that the average of the 1909 collection of milk in Massachusetts would refract below 38, and therefore 10 per cent. of water could be detected if it were added to the average milk sold in this State. Probably 40 per cent. of the samples collected would have given sera refracting above 38, and in these cases, 15 per cent. of added water could have been detected if the samples had been adulterated to that extent.

The Physical and Chemical Properties of Skimmed Milk, Whole Milk and Cream.

For the purpose of comparing the composition of whole milk, skimmed milk and cream, two samples of milk were passed through a separator and analyses were made of the whole milk, skimmed milk and cream. A sample of milk was then watered to an extent of about 20 per cent., the watered milk separated, and analyses were made of the whole milk, watered milk, watered skimmed milk and watered cream. The results of these analyses are recorded in Table VI.

TABLE VI. — *Analysis of Samples of Milk, Cream and Skimmed Milk.*

	Solids (Per Cent.).	Fat (Per Cent.).	Proteins (Per Cent.).	Ash (Per Cent.).	Solids not Fat (Per Cent.).	Sugar (Per Cent.).	Refraction of Copper Serum, 20°.
Sample 1 : —							
Cream,	41.71	36.20	2.16	0.45	5.51	2.90	37.8
Whole milk,	12.52	3.80	3.22	0.70	8.72	4.80	38.3
Skimmed milk,	9.57	0.62	3.48	0.75	8.95	4.85	38.5
Sample 2 : —							
Cream,	32.84	26.00	2.75	0.54	6.84	3.65	37.8
Whole milk,	12.92	3.90	3.41	0.76	9.02	4.85	37.9
Skimmed milk,	9.48	0.30	3.48	0.80	9.18	4.90	37.9
Sample 3 : —							
Whole milk,	12.97	3.90	3.38	0.74	9.07	4.95	38.3
Watered cream,	35.87	30.00	2.75	0.42	5.87	2.70	34.5
Watered milk,	10.48	3.20	2.72	0.61	7.28	3.95	34.4
Watered skimmed milk,	7.67	0.20	2.73	0.59	7.47	4.15	34.4

These figures show that the solids not fat of skimmed milk are, as one would expect, greater than the solids not fat of the whole milk from which it had been separated, and the solids not fat of the cream is less. It also shows that the refraction of the serum of cream and skimmed milk is practically the same as that of the whole milk from which they had been prepared.

CONCLUSIONS.

The following conclusions are obtained from this work: —

The indirect calculation of milk sugar serves to indicate whether or not a sample of milk is pure, skimmed or watered.

If the proteins exceed the fat, the sample has been skimmed.

If the copper serum has a refraction less than 36, a specific gravity less than 1.0245, or solids below 5.28 per cent., added water is indicated.

If the refraction of the sour serum is less than 38.3, its specific gravity below 1.0229 or the ash less than 0.73 per cent., added water is indicated.

Ten per cent. of water may be detected if added to the average milk and 15 per cent. can be detected if added to high-grade milk.

The copper serum of cream and skimmed milk are about the same as that of the whole milk from which it had been separated.

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Approved by
The State Board of Publication.

WEEKLY RETURNS OF DEATHS FROM CITIES AND TOWNS OF MORE THAN 10,000 POPULATION.

WEEK ENDING NOV. 5, 1910.

CITIES AND TOWNS.	Population. Census for 1910.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM—					
				Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	670,585	193	43	66	23	17	1	8	1
Worcester,	145,986	44	5	17	10	4	1	–	–
Fall River,	119,295	32	10	13	3	3	2	–	–
Lowell,	106,294	43	15	16	6	5	–	–	–
Cambridge,	104,839	33	10	14	4	5	–	2	–
New Bedford,	96,652	22	10	11	3	4	1	–	–
Lynn,	89,336	26	2	9	3	6	–	–	–
Springfield,	88,926	21	7	6	4	–	1	–	–
Lawrence,	85,892	20	9	9	2	1	2	–	–
Somerville,	77,236	19	5	7	4	1	–	1	–
Holyoke,	57,730	14	5	5	2	–	–	–	–
Brockton,	56,878	11	1	–	–	–	–	–	–
Malden,	44,404	8	1	–	–	–	–	–	–
Haverhill,	44,115	15	4	3	3	–	–	–	–
Salem,	43,697	5	1	3	1	1	1	–	–
Newton,	39,806	8	2	1	–	–	1	–	–
Fitchburg,	37,826	6	4	3	1	1	1	–	–
Taunton,	34,259	9	1	2	1	–	–	–	–
Everett,	33,484	7	1	1	–	1	–	–	–
Quincy,	32,642	4	2	1	1	–	–	–	–
Chelsea,	32,452	12	0	1	–	1	–	–	–
Pittsfield,	32,121	12	4	1	1	–	–	–	–
Waltham,	27,834	1	0	1	1	–	–	–	–
Brookline,	27,792	7	–	1	1	–	–	–	–
Chicopee,	25,401	6	4	1	1	–	–	–	–
Gloucester,	24,398	10	2	1	–	1	–	–	–
Medford,	23,150	5	1	2	1	–	–	–	–
North Adams,	22,019	6	1	–	–	–	–	–	–
Northampton,	19,431	3	0	1	–	–	–	–	–
Beverly,	18,650	1	–	–	–	–	–	–	–
Revere,	18,219	8	3	3	1	2	–	–	–
Leominster,	17,580	1	1	–	–	–	–	–	–
Attleborough,	16,215	2	1	–	–	–	–	–	–
Westfield,	16,044	2	1	1	–	1	–	–	–
Peabody,	15,721	3	2	–	–	–	–	–	–
Melrose,	15,715	6	2	3	–	1	1	–	–
Hyde Park,	15,507	9	1	6	1	–	–	5	–
Woburn,	15,308	4	2	1	–	–	–	–	–
Newburyport,	14,949	5	1	2	–	2	–	–	–
Gardner,	14,699	4	1	1	1	–	–	–	–
Marlborough,	14,579	3	0	1	–	1	–	–	–
Clinton,	13,075	1	1	–	–	–	–	–	–
Milford,	13,055	1	0	1	–	1	–	–	–
Adams,	13,026	6	4	3	1	–	1	–	–
Framingham,	12,948	5	1	4	2	–	1	–	–
Weymouth,	12,895	4	1	1	–	1	–	–	–
Watertown,	12,875	1	0	1	1	–	–	–	–
Southbridge,	12,592	2	1	1	1	–	–	–	–
Plymouth,	12,141	–	–	–	–	–	–	–	–
Webster,	11,509	4	3	1	1	–	–	–	–
Methuen,	11,448	4	1	–	–	–	–	–	–
Wakefield,	11,404	2	–	1	–	1	–	–	–
Arlington,	11,187	3	–	1	1	–	–	–	–
Greenfield,	10,427	2	1	1	1	–	–	–	–
Winthrop,	10,132	1	–	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,594,239	686	178	229	87	61	14	16	1

WEEK ENDING NOV. 12, 1910.

CITIES AND TOWNS.	Population. Census for 1910.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	670,585	181	38	71	34	20	2	3	–
Worcester,	145,986	48	15	10	6	–	1	–	–
Fall River,	119,295	36	18	15	5	1	1	–	–
Lowell,	106,294	36	15	11	4	2	–	–	–
Cambridge,	104,839	34	8	11	3	3	–	–	–
New Bedford,	96,652	30	13	12	3	4	2	–	–
Lynn,	89,336	26	5	9	5	3	–	1	–
Springfield,	88,926	35	9	15	8	1	1	1	–
Lawrence,	85,892	21	9	8	5	–	1	–	–
Somerville,	77,236	20	5	7	3	3	–	–	–
Holyoke,	57,730	14	7	8	4	–	–	–	–
Brockton,	56,878	12	7	6	4	–	1	1	–
Malden,	44,404	11	2	5	1	3	–	–	–
Haverhill,	44,115	8	1	1	1	–	–	–	–
Salem,	43,697	14	1	3	2	1	–	–	–
Newton,	39,806	9	2	2	2	–	–	–	–
Fitchburg,	37,826	15	6	4	2	1	1	–	–
Taunton,	34,259	15	3	10	4	2	2	–	–
Everett,	33,484	8	2	3	1	2	–	–	–
Quincy,	32,642	9	5	3	–	2	–	1	–
Chelsea,	32,452	8	3	3	1	1	–	–	–
Pittsfield,	32,121	10	2	2	2	–	–	–	–
Waltham,	27,834	8	1	2	–	1	–	–	–
Brookline,	27,792	2	–	–	–	–	–	–	–
Chicopee,	25,401	5	3	–	–	–	–	–	–
Gloucester,	24,398	10	–	1	–	1	–	–	–
Medford,	23,150	10	–	4	1	2	–	–	–
North Adams,	22,019	8	2	2	–	–	–	–	1
Northampton,	19,431	11	1	3	1	1	–	1	–
Beverly,	18,650	4	–	1	–	–	1	–	–
Revere,	18,219	4	2	–	–	–	–	–	–
Leominster,	17,580	4	1	2	2	–	–	–	–
Attleborough,	16,215	2	2	2	2	–	–	–	–
Westfield,	16,044	6	–	3	–	3	–	–	–
Peabody,	15,721	3	1	1	1	–	–	–	–
Melrose,	15,715	3	1	–	–	–	–	–	–
Hyde Park,	15,507	4	0	3	1	–	–	1	–
Woburn,	15,308	6	1	1	–	–	–	–	–
Newburyport,	14,949	6	–	2	1	–	–	–	–
Gardner,	14,699	3	1	1	–	1	–	–	–
Marlborough,	14,579	1	0	–	–	–	–	–	–
Clinton,	13,075	5	3	1	–	–	1	–	–
Milford,	13,055	4	1	1	1	–	–	–	–
Adams,	13,026	4	3	1	–	–	1	–	–
Framingham,	12,948	4	2	2	1	–	1	–	–
Weymouth,	12,895	3	–	2	–	2	–	–	–
Watertown,	12,875	4	1	–	–	–	–	–	–
Southbridge,	12,592	5	1	1	–	1	–	–	–
Plymouth,	12,141	–	–	–	–	–	–	–	–
Webster,	11,509	3	–	1	–	1	–	–	–
Methuen,	11,448	3	1	1	1	–	–	–	–
Wakefield,	11,404	4	–	1	–	–	–	–	–
Arlington,	11,187	3	–	1	1	–	–	–	–
Greenfield,	10,427	5	1	3	2	–	–	–	–
Winthrop,	10,132	3	–	2	1	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,594,239	750	205	264	116	62	16	9	1

WEEK ENDING NOV. 19, 1910.

CITIES AND TOWNS.	Population. Census for 1910.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM—					
				Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary	Diphtheria.	Typhoid Fever.	Measles.
Boston,	670,585	211	49	75	38	18	–	4	–
Worcester,	145,986	35	10	11	4	2	–	–	–
Fall River,	119,295	34	11	9	5	1	–	1	–
Lowell,	106,294	42	15	13	10	1	–	–	–
Cambridge,	104,839	34	8	11	4	6	–	–	–
New Bedford,	96,652	24	11	12	8	3	–	–	–
Lynn,	89,336	27	8	5	4	–	1	–	–
Springfield,	88,926	26	5	5	3	1	1	–	–
Lawrence,	85,892	25	10	15	7	2	–	–	–
Somerville,	77,236	22	4	3	2	–	–	–	–
Holyoke,	57,730	15	10	7	5	1	–	–	–
Brockton,	56,878	8	2	3	1	1	–	1	–
Malden,	44,404	9	1	–	–	–	–	–	–
Haverhill,	44,115	12	–	4	2	2	–	–	–
Salem,	43,697	6	–	1	–	1	–	–	–
Newton,	39,806	7	1	1	1	–	–	–	–
Fitchburg,	37 826	7	4	1	1	–	–	–	–
Taunton,	34,259	17	4	4	2	–	–	–	–
Everett,	33,484	7	2	1	–	1	–	–	–
Quincy,	32,642	7	0	2	–	2	–	–	–
Chelsea,	32,452	9	–	4	3	1	–	–	–
Pittsfield,	32,121	5	–	1	1	–	–	–	–
Waltham,	27,834	5	0	1	–	–	1	–	–
Brookline,	27,792	5	–	–	–	–	–	–	–
Chicopee,	25,401	5	2	2	2	–	–	–	–
Gloucester,	24,398	9	1	1	–	–	–	1	–
Medford,	23,150	3	–	2	1	–	–	–	–
North Adams,	22,019	8	1	2	1	–	–	–	–
Northampton,	19,431	7	1	1	1	–	–	–	–
Beverly,	18,650	4	1	–	–	–	–	–	–
Revere,	18,219	4	1	1	–	1	–	–	–
Leominster,	17,580	3	1	2	–	1	–	1	–
Attleborough,	16,215	2	1	–	–	–	–	–	–
Westfield,	16,044	5	2	–	–	–	–	–	–
Peabody,	15,721	–	–	–	–	–	–	–	–
Melrose,	15,715	1	0	–	–	–	–	–	–
Hyde Park,	15,507	8	1	1	–	1	–	–	–
Woburn,	15,308	2	1	1	–	–	–	–	–
Newburyport,	14,949	5	–	1	1	–	–	–	–
Gardner,	14,699	2	1	1	1	–	–	–	–
Marlborough,	14,579	2	0	–	–	–	–	–	–
Clinton,	13,075	2	1	–	–	–	–	–	–
Milford,	13,055	7	1	4	4	–	–	–	–
Adams,	13.026	3	1	1	–	1	–	–	–
Framingham,	12,948	3	1	–	–	–	–	–	–
Weymouth,	12,895	1	–	–	–	–	–	–	–
Watertown,	12,875	1	0	–	–	–	–	–	–
Southbridge,	12,592	1	–	–	–	–	–	–	–
Plymouth,	12,141	–	–	–	–	–	–	–	–
Webster,	11,509	0	–	–	–	–	–	–	–
Methuen,	11,448	4	1	1	–	–	1	–	–
Wakefield,	11,404	2	–	1	–	–	–	–	–
Arlington,	11,187	1	–	–	–	–	–	–	–
Greenfield,	10,427	1	–	–	–	–	–	–	–
Winthrop,	10,132	1	–	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,578,518	696	174	211	112	47	4	8	–

WEEK ENDING NOV. 26, 1910.

CITIES AND TOWNS.	Population. Census for 1910.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	670,585	217	55	75	35	18	2	5	–
Worcester,	145,986	54	13	18	8	8	1	–	1
Fall River,	119,295	41	15	11	4	5	–	–	–
Lowell,	106,294	21	9	8	5	–	–	3	–
Cambridge,	104,839	31	4	12	7	3	1	–	–
New Bedford,	96,652	35	14	16	6	2	4	1	–
Lynn,	89,336	22	3	4	3	1	–	–	–
Springfield,	88,926	23	4	8	6	2	–	–	–
Lawrence,	85,892	30	18	15	9	–	–	–	–
Somerville,	77,236	19	3	6	5	1	–	–	–
Holyoke,	57,730	12	3	2	1	1	–	–	–
Brockton,	56,878	14	2	3	–	2	–	1	–
Malden,	44,404	6	–	1	1	–	–	–	–
Haverhill,	44,115	11	2	5	1	2	–	1	–
Salem,	43,697	15	6	5	4	1	–	–	–
Newton,	39,806	6	1	3	2	1	–	–	–
Fitchburg,	37,826	7	1	2	2	–	–	–	–
Taunton,	34,259	12	0	3	1	1	–	–	–
Everett,	33,484	6	–	–	–	–	–	–	–
Quincy,	32,642	9	2	4	3	1	–	–	–
Chelsea,	32,452	15	3	3	–	2	–	1	–
Pittsfield,	32,121	8	4	2	–	–	–	–	–
Waltham,	27,834	4	0	1	1	–	–	–	–
Brookline,	27,792	5	1	1	1	–	–	–	–
Chicopee,	25,401	6	2	–	–	–	–	–	–
Gloucester,	24,398	5	–	–	–	–	–	–	–
Medford,	23,150	6	1	2	2	–	–	–	–
North Adams,	22,019	2	1	1	1	–	–	–	–
Northampton,	19,431	6	2	1	–	–	–	–	–
Beverly,	18,650	2	1	–	–	–	–	–	–
Revere,	18,219	1	1	1	1	–	–	–	–
Leominster,	17,580	1	–	–	–	–	–	–	–
Attleborough,	16,215	1	0	–	–	–	–	–	–
Westfield,	16,044	7	4	1	1	–	–	–	–
Peabody,	15,721	1	–	–	–	–	–	–	–
Melrose,	15,715	5	0	2	2	–	–	–	–
Hyde Park,	15,507	4	0	–	–	–	–	–	–
Woburn,	15,308	4	0	–	–	–	–	–	–
Newburyport,	14,949	4	1	3	3	–	–	–	–
Gardner,	14,699	3	1	2	–	–	–	–	–
Marlborough,	14,579	6	2	3	1	–	–	–	–
Clinton,	13,075	0	–	–	–	–	–	–	–
Milford,	13,055	5	0	–	–	–	–	–	–
Adams,	13,026	4	2	1	–	–	–	–	–
Framingham,	12,948	3	0	1	–	1	–	–	–
Weymouth,	12,895	–	–	–	–	–	–	–	–
Watertown,	12,875	1	1	–	–	–	–	–	–
Southbridge,	12,592	2	–	–	–	–	–	–	–
Plymouth,	12,141	–	–	–	–	–	–	–	–
Webster,	11,509	2	1	1	–	–	–	–	–
Methuen,	11,448	3	2	–	–	–	–	–	–
Wakefield,	11,404	2	2	1	–	1	–	–	–
Arlington,	11,187	2	–	2	–	1	–	–	–
Greenfield,	10,427	3	–	–	–	–	–	–	–
Winthrop,	10,132	2	–	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,581,344	716	187	230	116	54	8	12	1

WEEKLY RETURNS OF DEATHS FROM CERTAIN INFECTIOUS DISEASES.

DEATHS FROM INFECTIOUS DISEASES NOT SPECIFICALLY MENTIONED IN ABOVE TABLES DURING THE WEEKS OF NOVEMBER 5, 12, 19 AND 26, 1910.

DISEASE.	Place.	WEEK ENDING —			
		Nov. 5.	Nov. 12.	Nov 19.	Nov. 26.
Cerebro-spinal meningitis,	Arlington,	–	–	–	1
	Boston,	1	–	–	–
	Framingham,	1	–	–	–
	Holyoke,	–	1	–	–
	Malden,	–	1	–	–
	New Bedford,	1	–	–	–
	Worcester,	–	2	–	–
Scarlet fever,	Boston,	1	1	–	–
	Fall River,	2	–	–	–
	Lawrence,	–	–	1	–
	Lowell,	–	1	–	–
	North Adams,	–	1	–	–
	Pittsfield,	–	–	–	1
	Worcester,	–	–	1	–
Whooping cough,	Boston,	–	1	–	1
	Lawrence,	–	–	1	–
	Lowell,	–	–	1	–
	Springfield,	–	2	–	–
	Waltham,	–	1	–	–
	Worcester,	1	–	–	–
Erysipelas,	Boston,	–	1	1	2
Tuberculosis other than pulmonary.	Boston,	1	3	–	3
	Cambridge,	–	1	–	1
	Fall River,	–	1	–	–
	Holyoke,	2	1	–	–
	Hyde Park,	–	1	–	–
	Lawrence,	–	1	1	4
	Lowell,	1	–	1	–
	Medford,	–	1	–	–
	Melrose,	1	–	–	–
	New Bedford,	1	–	–	–
	Newburyport,	–	1	–	–
	North Adams,	–	–	1	–
	Taunton,	–	1	–	1
	Wakefield,	–	1	1	–
	Winthrop,	–	1	1	–
	Woburn,	–	1	–	–
	Worcester,	1	1	2	–
Meningitis other than cerebro-spinal.	Medford,	–	–	1	–

DEATHS FROM INFECTIOUS DISEASES, ETC. — *Concluded.*

DISEASE.	Place.	WEEK ENDING —			
		Nov. 5.	Nov. 12.	Nov. 19.	Nov. 26.
Influenza,	Boston,	–	–	1	–
	Greenfield,	–	1	–	–
Anterior poliomyelitis,	Chelsea,	–	1	–	–
	Haverhill,	–	–	–	1
	New Bedford,	–	–	1	1
	Springfield,	–	1	–	–

WEEKLY RETURNS OF CASES OF INFECTIOUS DISEASES.

CASES OF INFECTIOUS DISEASES REPORTED DURING THE WEEKS OF NOVEMBER 5, 12, 19 AND 26, 1910.

[Under the provisions of section 52 of chapter 75 of the Revised Laws.]

	WEEK ENDING —				
	Nov. 5.	Nov. 12.	Nov. 19.	Nov. 26.	Total.
Diphtheria,	175	153	151	134	613
Measles,	62	100	108	84	354
Scarlet fever,	139	116	84	112	451
Typhoid fever,	85	78	72	65	300
Tuberculosis, pulmonary,	108	100	116	108	432
Tuberculosis other than pulmonary,	–	–	2	1	3
Cerebro-spinal meningitis,	3	3	–	1	7
Meningitis other than cerebro-spinal,	–	–	–	–	–
Whooping cough,	15	17	20	34	86
Varicella,	41	49	64	51	205
Erysipelas,[1]	–	–	–	1	1
Mumps,[1]	4	8	6	–	18
Ophthalmia neonatorum,	6	11	16	3	36
Anterior poliomyelitis,	8	17	9	20	54
Tetanus,	1	–	–	–	1
Malaria,	–	–	–	–	–
Glanders,	–	–	–	–	–
Rabies,	–	1	–	–	1

[1] Erysipelas and mumps are not diseases notifiable under section 52 of chapter 75 of the Revised Laws. The figures concerning these diseases are, therefore, incomplete.

OPHTHALMIA NEONATORUM.

Owing to a misunderstanding in the office of the Boston Board of Health, notices of reported cases of ophthalmia neonatorum were not transmitted to the office of the State Board of Health in accordance with the statutes. The number of cases reported during the year up to Nov. 30, 1910, should be increased by 80.

MONTHLY REPORT ON INSPECTION OF FOOD AND DRUGS.

The following summary presents the results of the examination of food and drugs made by the State Board of Health during the month of November, 1910: —

Articles examined.	Number found to be of Good Quality.	Number adulterated or varying from the Legal Standard.	Total.	Articles examined.	Number found to be of Good Quality.	Number adulterated or varying from the Legal Standard.	Total.
Butter,	6	1	7	Meat products: —			
Breakfast cereal,	–	2	2	Pressed meats,	2	–	2
Canned fish,	2	1	3	Sausages,	7	7	14
Cider,	3	2	5	Mince meat,	2	–	2
Cream,	12	–	12	Hamburg steak,	2	–	2
Drugs,	52	9	61	Milk,	272	54	326
Extract lemon,	1	1	2	Olive oil,	6	–	6
Extract vanilla,	1	–	1	Proprietary foods,	1	1	2
Gluten flour,	4	–	4	Table sauce,	5	–	5
Jams and jellies,	7	–	7	Vinegar,	7	–	7
				Total,	392	78	470

The samples of drugs found to be adulterated were spirit of camphor, spirit of peppermint and tincture of iodine.

The cities and towns in which samples were collected were: Boston, Brookfield, Cambridge, Chelmsford, Fall River, Fairhaven, Fitchburg, Great Barrington, Hardwick, Haverhill, Hyde Park, Lowell, Lynn, Malden, Milford, Natick, New Bedford, Newburyport, North Reading, Pittsfield, Quincy, Somerville, Southbridge, Spencer, Webster, Whitman and Worcester.

PROSECUTIONS FOR VIOLATIONS OF THE LAW RELATING TO FOOD AND DRUGS.

Ten convictions were secured during the month of November, 1910, for selling adulterated food, as follows: —

No.	Name of Defendant.	Place.	Character of Article sold.
1	Cobb, Bates & Yerxa Company,	Boston,	Rolled Wheat.
2	Boston Dairy Company,	Boston,	Milk (total solids, 10.46).[1]
3	Boston Dairy Company,	Boston,	Milk (total solids, 11.32).
4	William O. Jackson,	Hardwick,	Milk (total solids, 10.58).[2]
5	Charles Meuse,	Weymouth,	Milk (total solids, 11.40).[2]
6	Charles Meuse,	Weymouth,	Milk (total solids, 11.46).
7	Hiram Miller,	Milford,	Milk (total solids, 12.28).[1]
8	Hiram Miller,	Milford,	Milk (total solids, 11.45).[1]
9	Frank S. McCarron,	Lynn,	Milk (total solids, 11.30).[2]
10	Clay M. Nutting,	Pittsfield,	Milk (total solids, 9.86).[2]

[1] Skimmed. [2] Watered.

Fines imposed, $175.

Number of Sample.	Character of Sample.	Name of Manufacturer, Wholesaler or Producer.	Results of Analyses.
13336	Victoria cream of tartar,	California Tartar Company, New York,	No cream of tartar present; consisted of calcium phosphate and wheat starch.
13493	Chlorinated lime,	Royal Brand Bleaching Powder, Leggett & Bro., New York,	50 per cent. U. S. P. strength.
13121	Extract of lemon,	The Goodwin Company, Cambridge Mass.,	No lemon oil present.
13162	Compound rock and rye,	Wood Pollard & Co., Boston Mass.,	Contained 36.57 per cent. alcohol by volume.
13214	Spirit of peppermint,	George H. Hartwell, Southbridge, Mass.,	46 per cent. U. S. P. strength.
13366	Spirit of peppermint,	W. A. DeMerritt, Boston, Mass.,	80 per cent. U. S. P. strength.
13367	Spirit of peppermint,	Castle Square Drug Company, Boston, Mass.,	63 per cent. U. S. P. strength.
6175 R	Milk,	Clay M. Nutting, Pittsfield, Mass.,	Total solids, 9.86 per cent.; fat, 3.30 per cent.; contained added water.
6177 R			Total solids, 9.92 per cent.; fat, 3.10 per cent.; contained added water.
6199 R			Total solids, 11.10 per cent.; fat, 3.60 per cent.; contained added water.
6201 R			Total solids, 11.58 per cent.; fat, 3.50 per cent.; contained added water.
6203 R			Total solids, 10.58 per cent.; fat, 3.40 per cent.; contained added water.
6205 R			Total solids, 10.86 per cent.; fat, 3.20 per cent.; contained added water.
6207 R	Milk,	William O. Jackson, Hardwick, Mass.,	Total solids, 13.50 per cent.; fat, 5.80 per cent.; contained added water.
6209 R			Total solids, 10.74 per cent.; fat, 3.00 per cent.; contained added water.
6211 R			Total solids, 11.48 per cent.; fat, 3.70 per cent.; contained added water.
6213 R			Total solids, 11.04 per cent.; fat, 3.30 per cent.; contained added water.
13324	Milk,	O. P. Cognac, Lowell, Mass.,	Total solids, 10.73 per cent.; fat, 3.10 per cent.; contained added water.
13349	Milk,	J. G. Welch, Quincy, Mass.,	Total solids, 11.20 per cent.; fat, 3.40 per cent.; contained added water.
13364	Milk,	Grant Barker, Quincy, Mass.,	Total solids, 8.74 per cent.; fat, 2.40 per cent.; contained added water.

LIST OF ADULTERATED OR IMPROPERLY LABELLED FOODS, ETC. — *Concluded.*

Number of Sample.	Character of Sample.	Name of Manufacturer, Wholesaler or Producer.	Results of Analyses.
6269 R	Milk,	Michael Pendergast, Great Barrington, Mass.,	Total solids, 11.90 per cent ; fat, 4.10 per cent.; contained added water.
q 5951	Milk,	Benjamin Galobaff, Webster, Mass.,	Total solids, 12.20 per cent.; fat, 4.20 per cent.; contained added water.
q 5952			Total solids, 10.24 per cent.; fat, 2.80 per cent.; contained added water.
q 5953			Total solids, 11.00 per cent.; fat, 3.70 per cent.; contained added water.
q 5961	Milk,	Leondas Ballard, Dudley, Mass.,	Total solids, 6.50 per cent.; fat, 0.40 per cent.; skimmed milk containing added water.
q 5962			Total solids, 4.70 per cent.; fat, 0.50 per cent.; skimmed milk containing added water.
6307 R	Milk,	Ralph C. Nichols, Lowell, Mass.,	Total solids, 10.67 per cent.; fat, 3.30 per cent.; contained added water.
6153 R	Milk,	Boston Dairy Company, Boston, Mass.,	Total solids, 11.26 per cent ; fat, 2.70 per cent.; proteins, 3.35 per cent.; skimmed milk.
6155 R			Total solids, 10.46 per cent.; fat, 2.30 per cent.; proteins, 2.99 per cent.; skimmed milk.
13291	Milk,	Albert Davenport, Hyde Park, Mass.,	Total solids, 11.18 per cent.; fat, 2.50 per cent.; proteins, 3.33 per cent.; skimmed milk.
13348	Milk,	William Johnson, Quincy, Mass.,	Total solids, 10.80 per cent.; fat, 2.00 per cent.; proteins, 3.42 per cent.; skimmed milk.
13360	Milk,	Richard H. Walsh, Quincy, Mass.,	Total solids, 10.84 per cent.; fat, 2.40 per cent.; proteins, 3.35 per cent.; skimmed milk.
13360	Milk,	Harrison G. Kennard, Wollaston, Mass.,	Total solids, 10.84 per cent.; fat, 2.40 per cent.; proteins, 3.35 per cent.; skimmed milk.
6305 R	Milk,	Ralph C. Nichols, Lowell, Mass.,	Total solids, 11.67 per cent.; fat, 2.35 per cent.; proteins, 3.64 per cent.; skimmed milk.
13364	Milk,	Harrison G. Kennard, Wollaston, Mass.,	Total solids, 8.74 per cent.; fat, 2.40 per cent.; contained added water.
6299 R	Milk,	John C. Haley, Chelmsford, Mass.,	Total solids, 11.90 per cent.; fat, 3.05 per cent.; proteins, 3.30 per cent.; skimmed milk.
6313 R	Milk,	Wallace Drew, Lowell, Mass.,	Total solids, 12.36 per cent.; fat, 3.00 per cent.; proteins, 3.47 per cent.; skimmed milk.

INSPECTION OF DAIRIES.

During the month of November, 1910, 178 dairies were examined in the following places: —

Place.	Number examined.	Number found to present no Objectionable Features.	Per Cent.	Number concerning which Letters were sent.	Per Cent.
Ashburnham,	–	–	–	–	–
Second inspection,	1	1	100.00	–	–
Dedham,	3	–	–	3	100.00
Second inspection,	24	11	45.83	13	54.17
Hardwick,	–	–	–	–	–
Second inspection,	1	–	–	1	100.00
Hopkinton,	–	–	–	–	–
Second inspection,	1	–	–	1	100.00
New Braintree,	3	1	33.33	2	66.67
Second inspection,	32	21	65.63	11	34.37
Southborough,	4	3	75.00	1	25.00
Second inspection,	35	26	74.29	9	25.71
Fifth inspection,	1	–	–	1	100.00
Westborough,	16	10	62.50	6	37.50
Second inspection,	57	35	61.40	22	38.60

Total number of dairies examined,	178
Number found to be free from objectionable conditions,	108
Number concerning which letters were sent,	70
Total number of conditions to which attention was called,	185
Percentage of dairies which passed inspection,	60.67

In addition to the above, 77 dairies were visited at which the sale of milk had been discontinued.

The names of the owners of the dairies found to be worthy of commendation follow: —

Ashburnham.

Class B.

Newton, L. W.*

Dedham.

Class B.

Bingham, Henry*
Blitzel, Peter*
Burgess, J. K.*†
Bussey, H. G.*†
Davenport, C. E.*
Dedham Temporary Asylum*
Dedham Town Farm*
Law, Samuel*
Lynch Bros.*
Smith, Warren*
Volk Bros.*†

*Second inspection. †Reported favorably on first inspection.

NEW BRAINTREE.

Class B.

Barnes, F. H.*
Carroll, J.* †
Cota, George* †
Crawford, L.*
Cuskey, J. W.*
Dunbar, E. S.*
Gleason, Charles A.* †
Gray, W. J.* †
Hare, Frank H.*
Howe, E. A.* †
Litchfield, George A.* †
Mara, Catharine
O'Brien, John* †
Pepper, Henry A.* †
Pollard, H. D.*
Potter, F. W.* †
Scoville, W. M.* †
Snow, G. F.* †
Tyler, Charles W.* †
Uszpratis, Aley* †
Utley, James P* †
Webb, Thomas* †
(Farms 1 and 2)

SOUTHBOROUGH.

Class A.

Deerfoot Farm* †
Newton, L. W.*

Class B.

Bacon, Estate of A. E.*
Baker, A. L.* †
Brewer, N. F.*
Butler, D. J.*
Clark, Samuel*
Cowern, J.*
Fay, F. A.*
Fay, Estate of J. A. J.*
Fay, Walter N.* †
Fisher, G. C.*
Follansby, L.*
Gilmore, A.* †
Gilmore Farm*
Greenough, A. P.*
Leland, Mrs. C. F.
Lincoln, Harry R.
Mauro, P.*
Newton, W. C.*
O'Brien, John*
Onthank, William*
Potter, Henry S. Jr.*
Richards, G. A.*
Siegener, F. K.
Taylor, C. E.*
Ulman, D.*
Wells, E. C.*
Wheeler, H. E.*

WESTBOROUGH.

Class B.

Adams, H. D.*
Ball, W. S.* †
Bardwell, Albert M.*
Bartlett, Frank* †
Braley, Waldo* †
Chamberlain, C. A.*
Chamberlain, William E.* †
Chase, F. W.
Davis, E. A.*
Engrall, A.*
Estey, E. G.*
Fay, B. Howard
Fay, Walter E.*
Fenno, Henry* †
Field, W. E.*
Fisher, J. A.*
Granger, Edward*
Hahn, Louis J.
Harrington, C.* †
Harvey, A. B.*
Hero, B. W.* †
Hersom, G.*
Heywood, Alfred H.* †
Holden, H. E.*
Huntley, David
Johnson, George H.*
Mansfield, Henry* †
McTaggart, Walter*
Nichols, H. H.
Nichols, H. M.*
Nichols, Walter F.*
Parker, R. F.*
Parker, W. O.
Pollard, M.*
Poskitt, T. W.* †
Ramee, D. E.*
Rice, Miss Elizabeth
Rogers, F. P.*
Sampson. A. A.
Stone, H. G.*
Stuart, A. T.
Trook, Bert
Vinal, J. P.*
Ward, Mrs. Anna*
York, A. W.* †

* Second inspection. † Reported favorably on first inspection.

ANTI-TYPHOID INOCULATION AS INTRODUCED INTO CERTAIN TRAINING SCHOOLS FOR NURSES IN MASSACHUSETTS.

By Mark Wyman Richardson, M.D., *Secretary of the State Board of Health of Massachusetts*, and Lesley H. Spooner, M.D., *Boston, Mass.*

The subject of typhoid fever at the Massachusetts General Hospital, with especial relation to its bacteriology and its immunity, had been the chief study of one of the writers (M. W. R.) for twelve years, when in 1909 it was decided to make a beginning, at least, with an investigation of specific anti-typhoid inoculation as a method of prophylaxis against the disease.

Experiments with specific sera, filtrates, residues and vaccines had not led to any very remarkable results in the treatment of the declared disease, although the use of these products for the possible prevention of relapses and recrudescences had given results of a distinctly encouraging character. There seemed, however, good reason to believe, especially, through the observations of Wright upon the British troops, that in prophylaxis, specific inoculation might have a field peculiarly successful. The unusual incidence of the disease among nurses had also been noted.

Joslin and Overlander[1] had found that "during the years 1902–06, inclusive, 26 nurses contracted typhoid fever while working in six hospitals. The average number of nurses employed each year in these hospitals was 322, and the total number of cases under their charge, 2,988. In other words, for each 114 cases of typhoid fever treated, 1 nurse came down with the disease. The typhoid morbidity rate for the nurses in these same hospitals was 161 per 10,000 living, instead of 20 per 10,000 living, which is approximately the typhoid morbidity rate for the whole population of the State."

As a result these investigators concluded that "the hospital nurse in Massachusetts is about eight times as liable to contract typhoid fever as the ordinary citizen."

Dr. Spooner[2] also, at my suggestion, looked up the cases at the Massachusetts General Hospital, and found that, for the ten years previous to 1909, anywhere from 2 to 6 of the nurses had come down annually with typhoid fever.

In view of these facts it was natural, therefore, that in inaugurating the use of specific inoculation appeal should be made first to the members

[1] Boston Medical and Surgical Journal, Vol. 157, page 427, Sept. 26, 1907.
[2] American Journal of Public Hygiene, August, 1909.

of training schools for nurses. A start was made at the Massachusetts General Hospital in 1909. The nurses were called together and the situation was placed before them in brief. A call for volunteers was then made and met with unexpected success. The work thus begun at the Massachusetts General Hospital has been continued along similar lines at nine other institutions. The inoculating has been done generally by locally interested physicians under the direction of one of us (L. H. S.). Indeed, the interest and co-operation of the hospital authorities and local physicians have been most hearty, and it gives me great pleasure publicly to acknowledge this fact, for without this co-operation no progress could have been made. The following table shows the institutions which have adopted the procedure and the number of individuals inoculated: —

Hospital.	Inoculator.	Number of Cases.
Massachusetts General Hospital,	L. H. Spooner, M.D.,	153
State Infirmary at Tewksbury,	H. R. Coburn, M.D.,	56
Waltham Hospital,	R. E. Wilson, M.D.,	32
Salem Hospital,	A. N. Sargent, M.D.,	24
New England Hospital for Women,	M. E. Morse, M.D.,	12
Children's Hospital,	W. P. Lucas, M.D.,	10
Boston State Hospital,	M. M. Canavan, M.D.,	40
Danvers State Hospital,	H. M. Adler, M.D.,	10
Brockton Hospital,	A. L. Beals, M.D.,	17
Worcester Memorial Hospital,	E. B. Bigelow, M.D.,	19
Miscellaneous cases,	L. H. Spooner, M.D.,	32
Total,		405

As regards the preparation of the vaccines, the following points are of interest: —

The culture used has been an old stock culture, and one utilized for a number of years in the laboratory for the making of Widal reactions. The organisms are grown on agar, suspended in salt solution, heated to 53° C. for one hour, and counted with the use of a Zeiss blood platelet counter. Lysol, ¼ of 1 per cent., is added to prevent the growth of any accidental contaminating organisms. The inoculations are given on the outer surface of the left upper arm, at the insertion of the deltoid muscle.

The number of inoculations given has been four, at five-day intervals. In the beginning the initial dose was placed at 50,000,000 and increased gradually up to a maximum of 200,000,000. In the more recent series we have increased the dose so that, although the initial dose is still 50,000,000, the maximum is now 300,000,000 or 400,000,000. The local

and general reactions experienced by the individuals inoculated have varied in severity. The experience among those inoculated at the Massachusetts General Hospital was approximately as follows: —

Ninety per cent. showed at most a very slight reaction and 10 per cent. showed a moderate reaction. In only one instance was it necessary for a nurse to give up her accustomed duties, and then only for a period of twelve hours. The specific effect of the inoculations upon the blood reactions, as previously reported, was as follows: —

Out of the first 100 cases inoculated at the Massachusetts General Hospital 94.2 per cent. developed in their blood an agglutinative strength of 1 to 25, and 80.6 per cent. showed a strength of at least 1 to 50.

In contrast to the experience of the ten previous years, 1909 and 1910 have shown no cases of typhoid fever among the nurses at the Massachusetts General Hospital, unless the following instance may be considered a typhoidal infection: —

A nurse who had received regular inoculations ten months previously suffered from an illness characterized by a temperature of 101.8° and all the symptoms of acute but mild infection. Physical examination, as well as bacteriological investigation of the blood and feces, was negative. The agglutination test, however, was positive at first in a dilution of 1 to 100, and two days later in a dilution of 1 to 200. Her temperature fell to normal on the third day and remained so. In looking back over the history of this case, it seems that two weeks after her series of inoculations, ten months previously, the agglutinative strength of her blood was 1 to 100. Whether the increased agglutinative strength on the third day in the subsequent infection can be regarded as a sufficient evidence for the diagnosis of typhoid fever must be considered doubtful. Even if we admit, however, that this case was one of typhoid fever, its extreme mildness is suggestive. Curiously enough the same individual is now suffering from an attack of measles, and the blood shows once more a typhoid reaction in a dilution of 1 to 100.

Among the individuals inoculated in hospitals other than the Massachusetts General Hospital it is stated that local or general reactions were absent or slight in 83 per cent. of the cases, of moderate severity in 13 per cent., and more severe in 4 per cent. Agglutination tests were not performed in all cases, but those in which the blood was investigated showed strengths ranging from 1 to 50 to 1 to 600.

Among the nurses inoculated in hospitals other than the Massachusetts General Hospital, two cases of typhoid fever have developed. The first case showed its earliest symptoms shortly after the first inoculation had been given. Mild fever was present for two weeks and convalescence

is now in progress. In this hospital an epidemic among the nurses was already in progress, and there can be little doubt that this nurse received her first inoculation during the incubation period.

The second case presents many points of interest. The patient was a woman who had been nursing two cases very sick with typhoid fever. Both were extremely delirious, absolutely incontinent, and both subsequently died. The attending nurse received three inoculations with a vaccine similar to that used upon 18 of her associates. None of the inoculations produced more than a slight reaction. Thirteen days after her first inoculation, however, and three days after her last inoculation she first showed signs of a mild typhoid infection. Her temperature, however, never exceeded 102.5°, and she suffered no interruptions in her convalescence. It seems reasonable to suppose that this nurse also was inoculated during the incubation period of the disease. In view of the fact that she was probably infected with organisms which were responsible for the death of two other individuals, it may not be entirely unreasonable to assume that the severity of her infection was attenuated by the inoculations which she received. In any case, these two histories serve very well to demonstrate that there is no danger in inoculating those individuals who in the near future are likely to be exposed to infection. In other words, the danger to be apprehended by what was designated by Wright as the negative phase of immunity said to follow bacterial inoculation seems to have no substantial basis in fact. The practical importance of this observation lies in the fact that, in the presence of a local epidemic of typhoid fever, widespread inoculation might be advised and carried out without fear that the individuals inoculated would thereby be made more susceptible to the disease than before.

As previously stated, the local and general reactions following inoculation are in the majority of individuals inconsiderable. It has been the experience, however, of one of us (L. H. S.) that latent or chronic foci of infection of non-typhoidal character may be lighted up by the typhoid inoculations. There were four such instances. First, chronic infectious arthritis of the knees; second, subacute urethritis; third, chronic infectious arthritis of the ankles, associated with flat foot; and fourth, chronic cholecystitis. No permanent damage was done, to be sure, but these recrudescences, by their temporary discomfort and inconvenience, were sufficient to make precautions advisable. Before inoculation, therefore, it is best to inquire somewhat into the previous history in search of old or latent infections, and to refuse to inoculate all persons showing a temperature over 99°.

In this connection it is interesting to note that just as latent in-

fections seem to be rendered acute temporarily by typhoid inoculation, so it has also been observed that a typhoid agglutination reaction, when once established in the body by specific inoculation, may be stimulated to reappearance by other infectious processes. Four instances have been seen in which strong agglutination strengths have been found in the blood long after inoculation, and associated with such diseases as grippe, tonsillitis, pleuropneumonia and measles.

Our experience, therefore, covers 1,588 inoculations practiced upon 405 individuals. As yet there have been no untoward results, and we believe that the inoculated individuals have acquired an increased resistance to typhoid infection which will last them for several years at least. We expect in the coming year to extend the influence of these inoculations, especially among nurses and others attendant upon the sick. Furthermore, we have strong faith that the procedure will, within a short time, find increasing favor with the general public, which, exposed as it is to many sources of infection, is in great need of specific protection.

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Approved by
The State Board of Publication.

WEEKLY RETURNS OF DEATHS FROM CITIES AND TOWNS OF MORE THAN 10,000 POPULATION.

WEEK ENDING DEC. 3, 1910.

CITIES AND TOWNS.	Population. Census for 1910.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	670,585	219	50	74	27	25	–	–	1
Worcester,	145,986	38	11	9	5	1	1	–	–
Fall River,	119,295	37	15	14	7	3	1	1	–
Lowell,	106,294	40	13	16	10	3	–	1	–
Cambridge,	104,839	29	4	14	8	5	–	–	–
New Bedford,	96,652	38	14	16	8	3	2	–	–
Lynn,	89,336	21	4	5	4	–	1	–	–
Springfield,	88,926	22	4	6	3	2	1	–	–
Lawrence,	85,892	18	6	9	5	2	1	–	–
Somerville,	77,236	19	4	5	2	1	–	–	–
Holyoke,	57,730	14	6	5	3	1	1	–	–
Brockton,	56,878	12	5	4	3	–	–	1	–
Malden,	44,404	13	2	1	1	–	–	–	–
Haverhill,	44,115	26	3	4	2	1	–	–	–
Salem,	43,697	12	5	4	3	–	1	–	–
Newton,	39,806	11	3	3	3	–	–	–	–
Fitchburg,	37,826	10	2	2	2	–	–	–	–
Taunton,	34,259	8	–	1	1	–	–	–	–
Everett,	33,484	7	–	1	1	–	–	–	–
Quincy,	32,642	6	2	1	1	–	–	–	–
Chelsea,	32,452	14	1	3	2	1	–	–	–
Pittsfield,	32,121	3	–	–	–	–	–	–	–
Waltham,	27,834	4	0	1	–	–	1	–	–
Brookline,	27,792	7	2	1	1	–	–	–	–
Chicopee,	25,401	1	1	–	–	–	–	–	–
Gloucester,	24,398	7	2	1	–	1	–	–	–
Medford,	23,150	3	–	–	–	–	–	–	–
North Adams,	22,019	5	1	2	–	1	–	–	1
Northampton,	19,431	6	1	3	3	–	–	–	–
Beverly,	18,650	4	–	2	1	–	–	–	–
Revere,	18,219	2	1	1	1	–	–	–	–
Leominster,	17,580	6	1	1	1	–	–	–	–
Attleborough,	16,215	7	0	3	–	1	–	1	–
Westfield,	16,044	10	1	3	1	1	–	1	–
Peabody,	15,721	5	2	–	–	–	–	–	–
Melrose,	15,715	1	0	1	1	–	–	–	–
Hyde Park,	15,507	3	0	–	–	–	–	–	–
Woburn,	15,308	0	–	–	–	–	–	–	–
Newburyport,	14,949	4	1	1	–	–	1	–	–
Gardner,	14,699	3	0	–	–	–	–	–	–
Marlborough,	14,579	3	0	–	–	–	–	–	–
Clinton,	13,075	2	–	–	–	–	–	–	–
Milford,	13,055	4	1	2	1	1	–	–	–
Adams,	13,026	3	–	–	–	–	–	–	–
Framingham,	12,948	2	–	1	1	–	–	–	–
Weymouth,	12,895	–	–	–	–	–	–	–	–
Watertown,	12,875	3	1	1	1	–	–	–	–
Southbridge,	12,592	3	3	2	1	–	1	–	–
Plymouth,	12,141	–	–	–	–	–	–	–	–
Webster,	11,509	2	1	–	–	–	–	–	–
Methuen,	11,448	2	2	–	–	–	–	–	–
Wakefield,	11,404	1	–	–	–	–	–	–	–
Arlington,	11,187	2	–	–	–	–	–	–	–
Greenfield,	10,427	6	–	1	–	1	–	–	–
Winthrop,	10,132	2	1	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,581,344	730	176	224	114	54	12	5	2

WEEK ENDING DEC. 10, 1910.

CITIES AND TOWNS.	Population Census for 1910.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	670,585	226	50	81	44	15	1	4	1
Worcester,	145,986	51	13	16	11	1	2	–	–
Fall River,	119,295	25	6	11	5	4	–	–	–
Lowell,	106,294	31	10	7	5	1	–	–	–
Cambridge,	104,839	27	5	13	4	5	2	–	–
New Bedford,	96,652	33	13	12	10	2	–	–	–
Lynn,	89,336	28	4	5	5	–	–	–	–
Springfield,	88,926	27	4	10	4	4	1	1	–
Lawrence,	85,892	31	15	9	6	1	1	1	–
Somerville,	77,236	12	1	3	2	1	–	–	–
Holyoke,	57,730	21	7	10	5	2	1	1	–
Brockton,	56,878	18	5	2	–	2	–	–	–
Malden,	44,404	14	2	7	2	3	–	–	–
Haverhill,	44,115	9	1	1	–	1	–	–	–
Salem,	43,697	13	5	4	3	–	1	–	–
Newton,	39,806	12	1	4	2	2	–	–	–
Fitchburg,	37,826	9	–	3	1	1	–	1	–
Taunton,	34,259	10	3	3	2	–	–	–	–
Everett,	33,484	4	1	1	–	1	–	–	–
Quincy,	32,642	9	1	1	–	1	–	–	–
Chelsea,	32,452	12	1	3	2	–	–	–	–
Pittsfield,	32,121	16	3	2	1	–	–	1	–
Waltham,	27,834	8	2	3	2	–	1	–	–
Brookline,	27,792	8	–	3	2	1	–	–	–
Chicopee,	25,401	3	2	2	2	–	–	–	–
Gloucester,	24,398	6	–	–	–	–	–	–	–
Medford,	23,150	4	–	3	1	2	–	–	–
North Adams,	22,019	5	2	3	–	–	2	–	–
Northampton,	19,431	12	2	5	3	2	–	–	–
Beverly,	18,650	6	1	–	–	–	–	–	–
Revere,	18,219	3	3	1	1	–	–	–	–
Leominster,	17,580	3	1	1	–	–	–	–	–
Attleborough,	16,215	3	1	–	–	–	–	–	–
Westfield,	16,044	5	1	2	1	1	–	–	–
Peabody,	15,721	1	–	1	1	–	–	–	–
Melrose,	15,715	5	2	–	–	–	–	–	–
Hyde Park,	15,507	2	–	2	1	1	–	–	–
Woburn,	15,308	3	1	1	–	1	–	–	–
Newburyport,	14,949	6	1	1	1	–	–	–	–
Gardner,	14,699	5	2	–	–	–	–	–	–
Marlborough,	14,579	0	–	–	–	–	–	–	–
Clinton,	13,075	5	–	1	1	–	–	–	–
Milford,	13,055	2	1	1	1	–	–	–	–
Adams,	13,026	3	1	1	–	1	–	–	–
Framingham,	12,948	3	1	1	–	1	–	–	–
Weymouth,	12,895	–	–	–	–	–	–	–	–
Watertown,	12,875	1	0	–	–	–	–	–	–
Southbridge,	12,592	1	1	–	–	–	–	–	–
Plymouth,	12,141	–	–	–	–	–	–	–	–
Webster,	11,509	2	1	1	–	–	–	–	–
Methuen,	11,448	1	–	1	–	1	–	–	–
Wakefield,	11,404	9	2	4	1	3	–	–	–
Arlington,	11,187	4	1	2	1	1	–	–	–
Greenfield,	10,427	1	–	1	1	–	–	–	–
Winthrop,	10,132	–	–	–	–	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,581,344	758	180	249	134	62	12	9	1

WEEK ENDING DEC. 17, 1910.

CITIES AND TOWNS.	Population. Census for 1910.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	670,585	217	46	81	34	24	4	2	1
Worcester,	145,986	46	9	4	1	1	1	–	–
Fall River,	119,295	33	21	17	9	2	–	–	–
Lowell,	106,294	40	8	10	7	1	2	–	–
Cambridge,	104,839	31	7	14	5	5	–	–	–
New Bedford,	96,652	27	10	8	3	1	1	–	–
Lynn,	89,336	18	6	4	1	3	–	–	–
Springfield,	88,926	31	6	6	2	–	–	–	–
Lawrence,	85,892	13	8	9	8	1	–	–	–
Somerville,	77,236	22	3	7	4	1	–	–	–
Holyoke,	57,730	18	8	5	3	1	–	–	–
Brockton,	56,878	14	1	3	1	2	–	–	–
Malden,	44,404	11	1	3	2	1	–	–	–
Haverhill,	44,115	16	4	5	4	1	–	–	–
Salem,	43,697	10	4	–	–	–	–	–	–
Newton,	39,806	11	3	2	1	–	–	1	–
Fitchburg,	37,826	12	3	4	3	1	–	–	–
Taunton,	34,259	12	2	4	3	1	–	–	–
Everett,	33,484	4	2	1	1	–	–	–	–
Quincy,	32,642	9	3	3	3	–	–	–	–
Chelsea,	32,452	13	2	6	6	–	–	–	–
Pittsfield,	32,121	10	3	3	1	–	–	–	2
Waltham,	27,834	7	1	2	1	1	–	–	–
Brookline,	27,792	7	–	2	2	–	–	–	–
Chicopee,	25,401	8	3	–	–	–	–	–	–
Gloucester,	24,398	4	–	–	–	–	–	–	–
Medford,	23,150	1	1	–	–	–	–	–	–
North Adams,	22,019	6	2	2	1	–	–	–	–
Northampton,	19,431	8	1	4	4	–	–	–	–
Beverly,	18,650	7	2	1	1	–	–	–	–
Revere,	18,219	4	1	–	–	–	–	–	–
Leominster,	17,580	11	2	3	1	–	–	–	–
Attleborough,	16,215	8	4	2	1	–	–	–	–
Westfield,	16,044	5	1	2	–	2	–	–	–
Peabody,	15,721	6	–	1	–	1	–	–	–
Melrose,	15,715	4	0	1	1	–	–	–	–
Hyde Park,	15,507	4	–	3	1	–	–	1	1
Woburn,	15,308	3	1	–	–	–	–	–	–
Newburyport,	14,949	7	2	1	1	–	–	–	–
Gardner,	14,699	1	0	–	–	–	–	–	–
Marlborough,	14,579	5	0	1	–	1	–	–	–
Clinton,	13,075	2	–	1	–	–	–	–	–
Milford,	13,055	1	0	1	1	–	–	–	–
Adams,	13,026	0	–	–	–	–	–	–	–
Framingham,	12,948	5	2	2	2	–	–	–	–
Weymouth,	12,895	–	–	–	–	–	–	–	–
Watertown,	12,875	3	1	1	1	–	–	–	–
Southbridge,	12,592	3	–	–	–	–	–	–	–
Plymouth,	12,141	–	–	–	–	–	–	–	–
Webster,	11,509	8	3	4	2	–	1	–	–
Methuen,	11,448	4	1	–	–	–	–	–	–
Wakefield,	11,404	3	–	–	–	–	–	–	–
Arlington,	11,187	5	–	–	–	–	–	–	–
Greenfield,	10,427	3	1	1	–	1	–	–	–
Winthrop,	10,132	3	1	1	1	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,581,344	764	190	235	123	52	9	4	4

WEEK ENDING DEC. 24, 1910.

CITIES AND TOWNS.	Population. Census for 1910.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM— Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	670,585	220	40	76	32	22	6	2	1
Worcester,	145,986	47	10	14	10	3	–	1	–
Fall River,	119,295	38	18	20	12	3	1	–	–
Lowell,	106,294	53	18	17	6	4	3	–	–
Cambridge,	104,839	27	6	8	5	1	1	–	–
New Bedford,	96,652	35	8	10	6	3	–	1	–
Lynn,	89,336	18	3	7	6	1	–	–	–
Springfield,	88,926	27	6	12	6	3	–	1	–
Lawrence,	85,892	30	10	10	5	4	1	–	–
Somerville,	77,236	21	4	10	5	2	1	–	–
Holyoke,	57,730	18	10	9	4	–	–	–	–
Brockton,	56,878	10	4	3	3	–	–	–	–
Malden,	44,404	17	3	7	4	3	–	–	–
Haverhill,	44,115	15	4	5	3	2	–	–	–
Salem,	43,697	12	1	6	4	2	–	–	–
Newton,	39,806	13	1	1	1	–	–	–	–
Fitchburg,	37,826	9	4	5	3	–	2	–	–
Taunton,	34,259	13	5	3	1	1	–	–	–
Everett,	33,484	11	1	4	2	2	–	–	–
Quincy,	32,642	4	3	4	2	1	–	–	–
Chelsea,	32,452	23	4	6	5	–	–	–	–
Pittsfield,	32,121	12	7	6	3	1	–	–	–
Waltham,	27,834	6	1	3	2	1	–	–	–
Brookline,	27,792	9	–	1	–	1	–	–	–
Chicopee,	25,401	7	2	1	1	–	–	–	–
Gloucester,	24,398	11	–	1	–	1	–	–	–
Medford,	23,150	6	2	2	1	1	–	–	–
North Adams,	22,019	8	2	3	2	–	–	–	–
Northampton,	19,431	10	1	4	3	–	–	–	–
Beverly,	18,650	3	–	1	1	–	–	–	–
Revere,	18,219	8	2	4	4	–	–	–	–
Leominster,	17,580	3	1	1	1	–	–	–	–
Attleborough,	16,215	4	1	1	–	–	1	–	–
Westfield,	16,044	3	–	1	–	–	1	–	–
Peabody,	15,721	4	2	2	2	–	–	–	–
Melrose,	15,715	11	2	5	3	1	–	–	–
Hyde Park,	15,507	6	2	2	1	–	1	–	–
Woburn,	15,308	1	0	–	–	–	–	–	–
Newburyport,	14,949	5	–	1	1	–	–	–	–
Gardner,	14,699	9	2	4	1	–	–	1	–
Marlborough,	14,579	0	–	–	–	–	–	–	–
Clinton,	13,075	2	–	–	–	–	–	–	–
Milford,	13,055	4	1	1	1	–	–	–	–
Adams,	13,026	1	–	–	–	–	–	–	–
Framingham,	12,948	6	2	1	1	–	–	–	–
Weymouth,	12,895	–	–	–	–	–	–	–	–
Watertown,	12,875	3	0	–	–	–	–	–	–
Southbridge,	12,592	4	1	2	1	–	–	–	–
Plymouth,	12,141	–	–	–	–	–	–	–	–
Webster,	11,509	2	2	–	–	–	–	–	–
Methuen,	11,448	9	4	3	–	2	1	–	–
Wakefield,	11,404	4	1	4	2	–	–	–	–
Arlington,	11,187	2	–	2	–	2	–	–	–
Greenfield,	0,427	6	0	3	3	–	–	–	–
Winthrop,	10,132	2	1	–	–	–	–	–	–

Recapitulation.

Total of reporting towns,	2,581,344	832	202	296	59	67	19	6	1

WEEK ENDING DECEMBER 31, 1910.

CITIES AND TOWNS.	Population. Census for 1910.	Reported Deaths in Each.	Deaths under Five Years.	DEATHS FROM—					
				Principal Infectious Diseases.	Acute Lung Diseases.	Tuberculosis, Pulmonary.	Diphtheria.	Typhoid Fever.	Measles.
Boston,	670,585	232	43	88	48	22	4	–	–
Worcester,	145,986	35	7	20	15	2	–	–	–
Fall River,	119,295	36	15	18	9	3	1	–	–
Lowell,	106,294	41	12	4	3	–	–	–	–
Cambridge,	104,839	28	10	13	6	2	4	1	–
New Bedford,	96,652	39	12	12	9	2	–	–	–
Lynn,	89,336	23	–	5	1	2	–	1	–
Springfield,	88,926	27	7	12	6	2	2	–	–
Lawrence,	85,892	35	9	14	7	3	1	–	1
Somerville,	77,236	23	7	11	5	4	–	–	–
Holyoke,	57,730	28	9	11	6	3	–	–	–
Brockton,	56,878	12	2	4	3	–	–	–	–
Malden,	44,404	19	3	2	1	1	–	–	–
Haverhill,	44,115	18	3	7	3	–	2	–	–
Salem,	43,697	18	5	9	7	1	1	–	–
Newton,	39,806	10	1	1	–	–	–	–	–
Fitchburg,	37,826	11	4	6	4	2	–	–	–
Taunton,	34,259	13	4	3	2	1	–	–	–
Everett,	33,484	7	1	1	1	–	–	–	–
Quincy,	32,642	8	1	5	4	–	–	–	–
Chelsea,	32,452	9	3	–	–	–	–	–	–
Pittsfield,	32,121	25	5	5	3	–	–	–	2
Waltham,	27,834	7	0	3	3	–	–	–	–
Brookline,	27,792	3	–	–	–	–	–	–	–
Chicopee,	25,401	5	2	2	1	1	–	–	–
Gloucester,	24,398	8	1	2	–	1	–	–	–
Medford,	23,150	4	–	1	1	–	–	–	–
North Adams,	22,019	3	1	–	–	–	–	–	–
Northampton,	19,431	8	1	1	1	–	–	–	–
Beverly,	18,650	4	–	1	1	–	–	–	–
Revere,	18,219	7	–	3	2	1	–	–	–
Leominster,	17,580	2	–	1	–	–	–	–	–
Attleborough,	16,215	7	1	2	1	–	–	1	–
Westfield,	16,044	1	–	–	–	–	–	–	–
Peabody,	15,721	4	–	1	–	–	–	–	–
Melrose,	15,715	3	0	1	1	–	–	–	–
Hyde Park,	15,507	4	3	1	–	–	1	–	–
Woburn,	15,308	8	1	1	–	–	–	–	–
Newburyport,	14,949	6	–	2	1	1	–	–	–
Gardner,	14,699	2	0	2	1	–	–	–	–
Marlborough,	14,579	2	0	–	–	–	–	–	–
Clinton,	13,075	9	–	2	1	–	–	–	–
Milford,	13,055	3	1	1	1	–	–	–	–
Adams,	13,026	1	–	–	–	–	–	–	–
Framingham,	12,948	6	1	3	2	1	–	–	–
Weymouth,	12,895	–	–	–	–	–	–	–	–
Watertown,	12,875	3	1	2	–	–	–	–	–
Southbridge,	12,592	2	2	–	–	–	–	–	–
Plymouth,	12,141	–	–	–	–	–	–	–	–
Webster,	11,509	4	–	1	1	–	–	–	–
Methuen,	11,448	3	2	1	–	1	–	–	–
Wakefield,	11,404	3	–	1	1	–	–	–	–
Arlington,	11,187	2	1	1	1	–	–	–	–
Greenfield,	10,427	3	–	–	–	–	–	–	–
Winthrop,	10,132	1	–	1	1	–	–	–	–
Recapitulation.									
Total of reporting towns,	2,581,344	808	181	288	164	56	16	3	3

WEEKLY RETURNS OF DEATHS FROM CERTAIN INFECTIOUS DISEASES.

Deaths from Infectious Diseases not specifically mentioned in above Tables during the Weeks of December 3, 10, 17, 24 and 31, 1910.

DISEASE.	Place.	Week ending — Dec. 3.	Dec. 10.	Dec. 17.	Dec. 24.	Dec. 31.
Cerebro-spinal meningitis,	Boston,	–	2	1	1	–
	Lowell,	1	–	–	–	–
	Pittsfield,	–	–	–	1	–
	Somerville,	1	–	–	–	1
	Worcester,	2	1	–	–	2
Scarlet fever,	Boston,	–	2	1	2	1
	Haverhill,	–	–	–	–	2
	Leominster,	–	–	–	–	1
	Lowell,	–	1	–	–	–
	Lynn,	–	–	–	–	1
	Malden,	–	1	–	–	–
	Newton,	–	–	–	–	1
	North Adams,	–	–	–	1	–
	Quincy,	–	–	–	1	1
	Somerville,	–	–	1	1	–
	Watertown,	–	–	–	–	1
Whooping cough,	Attleborough,	–	–	1	–	–
	Boston,	6	–	2	1	2
	Fall River,	–	–	2	2	1
	Holyoke,	–	–	–	–	1
	Lawrence,	–	–	–	–	1
	North Adams,	–	–	1	–	–
	Pittsfield,	–	–	–	1	–
	Springfield,	–	–	2	–	–
Erysipelas,	Beverly,	1	–	–	–	–
	Boston,	–	–	5	–	–
	Holyoke,	–	–	–	1	–
	Lowell,	–	–	–	1	–
	Taunton,	–	–	–	1	–
	Worcester,	–	–	–	–	1
Tuberculosis other than pulmonary.	Boston,	3	4	2	2	9
	Cambridge,	–	–	2	1	–
	Chelsea,	–	1	–	1	–
	Clinton,	–	–	–	–	1
	Gardner,	–	–	–	–	1
	Gloucester,	–	–	–	–	1
	Holyoke,	–	–	1	–	–
	Leominster,	–	–	2	–	–
	Lowell,	1	–	–	3	1
	Melrose,	–	–	–	1	–
	Peabody,	–	–	–	–	1
	Somerville,	–	–	–	1	1
	Southbridge,	–	–	–	1	–
	Springfield,	–	–	2	1	–
	Webster,	–	1	–	–	–
	Worcester,	–	1	1	–	–

DEATHS FROM INFECTIOUS DISEASES, ETC. — *Concluded.*

DISEASE.	Place.	WEEK ENDING — Dec. 3.	Dec. 10.	Dec. 17.	Dec. 24.	Dec. 31.
Meningitis other than cerebro-spinal.	Brockton,	–	–	–	–	1
	Clinton,	–	–	1	–	–
	Leominster,	–	1	–	–	–
Influenza,	Attleborough,	1	–	–	–	–
	Boston,	1	2	–	–	–
	Cambridge,	–	1	–	–	–
	Fall River,	–	1	–	–	–
	Haverhill,	1	–	–	–	–
	New Bedford,	–	–	–	–	1
Anterior poliomyelitis,	Holyoke,	–	–	–	1	–
	New Bedford,	–	–	1	–	–
	North Adams,	–	1	–	–	–

WEEKLY RETURNS OF CASES OF INFECTIOUS DISEASES.

CASES OF INFECTIOUS DISEASES REPORTED DURING THE WEEKS OF DECEMBER 3, 10, 17, 24 AND 31, 1910.

[Under the provisions of section 52 of chapter 75 of the Revised Laws.]

	WEEK ENDING — Dec. 3.	Dec. 10.	Dec. 17.	Dec. 24.	Dec. 31.	Total.
Diphtheria,	168	195	129	163	176	831
Measles,	140	218	143	257	206	964
Scarlet fever,	130	116	106	116	126	594
Typhoid fever,	53	41	24	30	26	174
Tuberculosis, pulmonary,	128	107	115	111	118	579
Tuberculosis other than pulmonary,	3	1	3	–	2	9
Cerebro-spinal meningitis,	5	1	1	2	4	13
Whooping cough,	54	37	40	40	79	250
Varicella,	63	66	56	65	46	296
Ophthalmia neonatorum,	13	6	6	6	12	43
Anterior poliomyelitis,	14	4	6	2	3	29
Mumps,[1]	2	3	8	5	11	29
Tetanus,	–	–	1	–	–	1
Trachoma,	3	–	1	–	–	4

[1] Erysipelas and mumps are not diseases notifiable under section 52 of chapter 75 of the Revised Laws. The figures concerning these diseases are, therefore, incomplete.

MONTHLY REPORT ON INSPECTION OF FOOD AND DRUGS.

The following summary presents the results of the examination of food and drugs made by the State Board of Health during the month of December 1910:—

Articles examined.	Number found to be of Good Quality.	Number adulterated or varying from the Legal Standard.	Total.	Articles examined.	Number found to be of Good Quality.	Number adulterated or varying from the Legal Standard.	Total.
Butter,	7	–	7	Maple syrup,	1	–	1
Canned fish,	1	–	1	Meat products: —			
Canned fruit and vegetables,	2	–	2	Hamburg steak,	3	–	3
Cheese,	3	–	3	Jellied tongue,	1	–	1
Cider,	2	2	4	Mince meat,	5	–	5
Cocoa,	3	–	3	Pressed meat,	3	–	3
Coffee extract,	–	1	1	Sausages,	22	8	30
Condensed milk,	1	–	1	Milk,	456	49	505
Confectionery,	4	–	4	Molasses,	2	–	2
Cream,	50	1	51	Nuts,	1	–	1
Cream of tartar,	2	–	2	Olive oil,	6	2	8
Dried fruit,	1	–	1	Oysters,	2	–	2
Drugs,	70	24	94	Pastry,	1	–	1
Flavoring extracts: —				Peanut butter,	1	–	1
Lemon,	2	–	2	Peanut oil,	1	–	1
Nutmeg,	1	–	1	Pickles,	9	2	11
Vanilla,	7	–	7	Salad oil,	1	–	1
Winter green,	1	–	1	Spices,	14	–	14
Grape juice,	1	–	1	Sugar,	1	–	1
Jams, jellies and preserves,	8	–	8	Syrups,	3	–	3
Lard,	3	1	4	Table sauces,	4	–	4
Maple sugar,	–	2	2	Vinegar,	4	–	4
				Yeast,	–	1	1
				Total,	710	93	803

The cities and towns in which samples were collected were: Attleborough, Ayer, Beverly, Boston, Brookline, Cambridge, Chelsea, Dedham, Dighton, Everett, Fall River, Fitchburg, Forge Village, Great Barrington, Haverhill, Hyde Park, Kingston, Lawrence, Lowell, Malden, Marlborough, Melrose, Milford, Newburyport, Newton, Peabody, Plymouth, Reading, Salem, Taunton, Waltham, Webster, West Boylston, Winchester, Woburn and Worcester.

PROSECUTIONS FOR VIOLATIONS OF THE LAW RELATING TO FOOD AND DRUGS.

Ten convictions were secured during the month of December, 1910, for selling adulterated food and drugs, as follows:—

No.	Name of Defendant.	Place.	Character of Article sold.
1	Henry Siegel Company,	Boston,	Denatured alcohol.
2	Samuel F. Chase,	Fall River,	Butter. (Oleomargarine.)
3	Geo. W. Bliss,	Fall River,	Cider.
4	Edward Wallenberg,	Boston,	Essence peppermint.
5	Mathew J. Bennett,	Woburn,	Milk (total solids, 11.69).[1]
6	John A. Cunningham,	Newton,	Milk (total solids, 12.24).[2]
7	John A. Cunningham,	Newton,	Milk (total solids, 7.94).[1]
8	Daniel Derby,	Dracut,	Milk (total solids, 9.60).[1]
9	John C. Haley,	Lowell,	Milk (total solids, 11.90).
10	Maxie Kale,	Boston,	Tincture of iodine.

[1] Skimmed. [2] Watered.

Fines imposed, $140.

LIST OF ADULTERATED OR IMPROPERLY LABELED FOODS, ETC., FOR DECEMBER, 1910.

Number of Sample.	Character of Sample.	Name of Manufacturer, Wholesaler or Producer.	Results of Analyses.
13493	"Royal" brand bleaching powder,	Leggett & Bro., New York,	50 per cent. U. S. P. strength.
6397 R	"Varsity" brand peppermint,	Varsity Extract Company, West Lynn, Mass.,	Trace of peppermint oil present.
7338 N	Spirit of peppermint,	Samuel B. Roos, Roxbury, Mass.,	52.6 per cent. U. S. P. strength.
7010 N	Tinture of iodine,	The Savin Drug Company, Roxbury, Mass.,	74 per cent. U. S. P. strength.
13467	Denatured alcohol,	Pyro, Peerson Hardware Company, Pittsfield, Mass.,	Denatured alcohol, not properly labeled.
6385 R	Colonial spirits (wood alcohol),	Berry Bros., Detroit, Mich.,	Wood alcohol, not properly labeled.
12701	Wood alcohol,	Healy & Wyman Hardware Company, East Boston, Mass.,	Wood alcohol, not properly labeled.
6579 R	Denatured alcohol,	J. C. Bennett, Lowell, Mass.,	Denatured alcohol, not properly labeled.
13594	Denatured alcohol,	W. Bowman Cutter, Roxbury, Mass.,	Denatured alcohol, not properly labeled.
13595	Denatured alcohol,	J. A. McAuley, Roxbury, Mass.,	Denatured alcohol, not properly labeled.
13489	Denatured alcohol,	Hall & Lyon Company, of New England,	Denatured alcohol, not properly labeled.
6497 R	Denatured alcohol,	Houghton & Dutton Company, Boston, Mass.,	Denatured alcohol, not properly labeled.
12889	Denatured alcohol,	Morer-Winslow Drug Shop, Boston, Mass.,	Denatured alcohol, not properly labeled.
6589 R	Denatured alcohol,	John T. Cushman, West Newton, Mass.	Denatured alcohol, not properly labeled.
q 6017	Milk,	Hans Nielson, Oxford, Mass.,	Total solids, 11.54 per cent.; fat, 3.90 per cent.; contained added water.
q 6018			Total solids, 10.26 per cent.; fat, 3.10 per cent.; contained added water.
q 6019			Total solids, 10.20 per cent.; fat, 3.10 per cent.; contained added water.
q 6020			Total solids, 10.20 per cent.; fat, 3.20 per cent.; contained added water.
q 6021			Total solids, 11.26 per cent.; fat, 4 20 per cent.; contained added water.
q 6022			Total solids, 9.94 per cent.; fat, 3.10 per cent.; contained added water.
q 6023			Total solids, 9.96 per cent.; fat, 3.20 per cent.; contained added water.
q 6024			Total solids, 10.04 per cent.; fat, 3 20 per cent.; contained added water.

6415 R	Milk, ...	John A. Cunningham, Waltham, Mass., ...	Total solids, 12.24 per cent.; fat, 4.30 per cent.; contained added water.
7346 N	Milk, ...	Joseph E. Banville, Swansea, Mass., ...	Total solids, 11.62 per cent.; fat, 3.95 per cent.; contained added water.
6351 R	Milk, ...	Matthew J. Bennett, Woburn, Mass., ...	Total solids, 11.69 per cent.; fat, 2.90 per cent.; proteins, 3.48 per cent.; skimmed milk.
6355 R			Total solids, 11.80 per cent.; fat, 3.05 per cent.; proteins, 3.38 per cent.; skimmed milk.
6571 R	Milk, ...	John C. Fox, Dracut, Mass., ...	Total solids, 9.80 per cent.; fat. 0.20 per cent.; skimmed milk.

INSPECTION OF DAIRIES.

During the month of December, 1910, 200 dairies were examined in the following places: —

Place.	Number examined.	Number found to present no Objectionable Features.	Per Cent.	Number concerning which Letters were sent.	Per Cent.
Boylston,	2	–	–	2	100.00
Second inspection,	24	8	33.33	16	66.67
Third inspection,	1	–	–	1	100.00
Dover,	2	–	–	2	100.00
Second inspection,	19	12	63.16	7	36.84
Third inspection,	1	1	100.00	–	–
Gloucester,	–	–	–	–	–
Third inspection,	1	–	–	1	100.00
Holden,	7	1	14.29	6	85.71
Second inspection,	31	18	58.06	13	41.94
Shrewsbury,	10	7	70.00	3	30.00
Second inspection,	46	19	41.30	27	58.70
West Boylston,	17	9	52.94	8	47.06
Second inspection,	29	18	62.07	11	37.93
Westwood,	2	1	50.00	1	50.00
Second inspection,	8	6	75.00	2	25.00

Total number of dairies examined, ... 200
Number found to be free from objectionable conditions, ... 100
Number concerning which letters were sent, ... 100
Total number of conditions to which attention was called, ... 261
Percentage of dairies which passed inspection, ... 50.00

In addition to the above, 97 dairies were visited at which the sale of milk had been discontinued.

The names of the owners of the dairies found to be worthy of commendation follow: —

Boylston.

Class B.

Boylston Town Farm*
Flagg, Levi L.*
Flagg, M.* †
Philadelphia Ice Cream Co.*
Reed, Henry L.*
Shattuck, G. W.* †
Stark, L. S.* †
Walker & Stotter*

Dover.

Class A.

Porter, Dr. W. T.* †

Class B.

Battele, J. S.* †
Beldon, C. M.* †
Bond, R. H.*
Brown, Charles*
Chickering, G. E.*
Comiskey, M. W.* †
Hanchett, H.‡
Heard, Mrs. H. M.*
McGill, James*
McKenzie, George*
McNamara, Mrs. Mary*
Post, J. H. & G. E.*

* Second inspection. † Reported favorably on first inspection. ‡ Third inspection.

HOLDEN.

Class B.

Anderson, L.*
Anderson, Otto F.* †
Ball, Charles J.* †
Carlson, Gustavus*
Chamberlain, Albert B.* †
Chamberlain, W. M.* †
Clarke, Mrs. E. C.*
Condon, A. O.* †
Cook & LaCroix
Fairbanks, E. L.*
Holton, B.*
Howe, Thomas W.* †
Hubbard, F. C.*
Jordan, E. B.*
Linquist, O.*
Madsen, Hans*
Nelson, S.* †
Otterson, B.*
Packard, O. W.* †

SHREWSBURY.

Class A.

Wood, C. W.*

Class B.

Chamberlain, W. B.*
Clapp, A. P.
Dufresne, J. E. & Sons*
Farrow, Adam* †
Freeman, Henry F.*
Gamache, G. P.*
Harlow, Arthur J.*
Harlow, Harry A.*
Harlow, Henry*
Harlow, H. J.*
Haynes, W. H.*
Horr, George E.
Newton, Fred*
Newton, Henry O.*
Plimpton, L. P.*
Porter, Fletcher
Robbins, H. E.
Rockwell, Dr. A. P.
Russell, Walter* †
Shrewsbury Town Farm*
Stockwell, Estate of Sumner*
Walker, Everett*
Weagle, N. W.
Wheeler, Charles*
Young, Arthur

WEST BOYLSTON.

Class A.

Scarlett, Andrew J.*

Class B.

Bigelow, J. M.*
Blodgett, W. H.* †
Calcia, Carlo
Cavanaugh, Lawrence*
Clark, F. E.
Fairbank, Henry H.
Fairbanks, Edwin C.*
Frost, Dr. E. E.
Goodale, Aaron*
Hall, Arthur C.*
Hunting, Arthur J.*
Keith, John F.*
Keyes, William*
Lane, Edward
Lundgren, P.*
Noyes, Mrs. E. L.*
Parker, William*
Pierce, William*
Rater Bros.
Robbins, J. W.
Safer Bros.*
Smith, John*
Snow, Albert N.
Surabian, John
West Boylston Town Farm*
Wood, Willie B.*

WESTWOOD.

Class A.

Crane, Joshua Jr.* †

Class B.

Colburn, Miss Nancy*
Colburn, W. P.*
Forbes, W. Cameron* †
Macleod, William A.* †
Rice, A. W.* †
Sutermeister, C. F.

* Second inspection. † Reported favorably on first inspection.

FACTORY INSPECTION AND THE PUBLIC HEALTH.[1]

By the Assistant to the Secretary of the State Board of Health.

By factory inspection is meant the inspection of factories and industrial establishments for the protection of the health, safety and welfare of persons engaged in industrial pursuits. Such inspection implies careful study and painstaking investigations, which require the services of physicians well trained in public health work as well as persons, not physicians, who, for some purposes, have had special technical education.

The principle underlying the system of factory inspection in Massachusetts is unique in that it recognizes a sharp separation between the police function and the health function in this field. From the point of view of public health, factory inspection comes to mean

The Medical Inspection of Factories.

This includes a scientific study of factory and occupational hygiene, and the constant investigation of the prevalence of infectious and communicable diseases and dangerous influences within and without the factory and the home, under the supervision of a board whose duty it is to study the health of the community in its broadest sense.

Owing to the rapid progress in the field of preventive medicine, the day of routine factory inspection, from a health point of view, is passed; the health and safety of our men, women and children employed in industrial establishments are now considered in the light of such present-day knowledge as science and medical research afford. Four years ago there was no law in Massachusetts relating to the regulation of the humidity and temperature in textile factories; to-day, as the result of an investigation made by the State Board of Health during the years 1905-10, we have a law which is bound to result in the better protection of the health of the employees in those establishments whose standards are not high enough to meet reasonable and practicable requirements. One year ago Massachusetts had no law by which minors in factories and workshops could be protected against poisonous and irritating dusts generated in the course of a manufacturing process; to-day, as the result of inquiries made by the State Board of Health, — largely through the efforts and observations of the State Inspectors of Health, — there is a law which is of inestimable value, permitting, as it does, work of a dangerous nature by minors only on condition that due care is taken by both employer and employees to make the occupation a reasonably safe one.

[1] Read before the Cambridge Medical Improvement Society, Colonial Club, Cambridge, Jan. 23, 1911.

The Legislatures of Massachusetts have shown great wisdom and foresight in the legislation enacted during the years 1904, 1905, 1907, and 1910, in bringing about, for the protection of the health of the community, the opportunity to study factory conditions in Massachusetts in connection with community conditions. Infectious diseases and all influences dangerous to the public health are thus carefully investigated, and, so far as possible, prevented. During the last three and one-half years the public have had an opportunity to recognize the fact that the health inspectors in factory communities acquaint themselves with the hygiene of the town or city, especially in the workmen's quarters, and are constantly investigating tuberculosis and other diseases dangerous to the public health. Within the factory the inspectors, knowing that tuberculosis of the lungs is a common consequence of overcrowding and exposure to vitiated air and dust, including the various kinds of trade dust and other impurities injurious to health which are generated in the course of the manufacturing processes carried on therein, pay especial attention to ventilation. In such work the position of the health inspectors is unique, for with their medical knowledge, which is indispensable to the proper enforcement of the statutes, they may appeal to the medical profession on the one hand and to the laity on the other, teaching all that the promotion of public health is a matter which concerns not only the medical profession but every profession and every person.

Nor is the interrelation of factory and community work dependent upon the existence of infectious or communicable diseases. Equally important, for the detection of occupational diseases or intoxications within the factory, such as lead and mercurial poisoning and naphtha intoxication, is the practical co-operation between our hospital and practicing physicians and the inspectors of health, to whom is entrusted the enforcement of those factory laws which relate to the health and welfare of the employees. Practical illustrations of this interrelation of factory and community work, from the point of view of discovering infectious and occupational diseases, are the following: —

1. While inquiring concerning the health of the minors employed in one large manufacturing establishment, a State Inspector of Health discovered, by physical examination, signs of beginning pulmonary tuberculosis in 11 minors. The inspector acting under the supervision of the State Board of Health and as intermediary between the State Board of Health and the local health authority, reported the cases of tuberculosis to both boards, thus complying with the law relating to the notification of communicable diseases, and assisted the local board in placing the minors under treatment, thereby giving the latter proper care and protecting the public — including the persons employed in the factory where the minors were found — from infection.

2. Notwithstanding the fact that an inspection of a large rubber establishment, failed to disclose reports of cases of lead poisoning, a study of the case records

in one of the Boston hospitals — by permission of the resident physician — showed more than a dozen cases of lead poisoning which could be traced to one department or process in the particular establishment referred to. Consequently, this department is now under the eye of the medical inspector, and no minors are allowed to work therein.

As might be expected, an intimate knowledge of factory and community conditions is giving rise to facts which are invaluable to a proper understanding of the probable effects of industry upon health and to the practical solution of problems arising in connection with the work of persons employed in industrial establishments. Time and again instances have been revealed to show conclusively that outside influences affect the health of the worker as much as, or more than, the circumstances of his trade, and it is a well-known fact that many occupations draw their workers from that portion of the population which, if not already diseased, is predisposed, by health, habit and home surroundings, to anemia, tuberculosis and other disorders, the onset of which may be hastened or delayed, according to circumstances. Detection of the prevalence of disease among factory employees is of the greatest importance, and some co-operation with the local health authorities, and, very frequently, with the family physician, is a necessity for the protection of the public health. The same medical inspectors are constantly in touch with the prevalence of diseases in their respective communities, and therefore, with practicing physicians, whose assistance they frequently get, not only concerning infectious but occupational diseases.

The State sanatoria at Rutland, North Reading, Lakeville and Westfield send notification to the State Inspectors of Health of the addresses of tuberculous patients recently admitted, so that in every instance the inspectors can see to it that the local board of health is notified, and shall clean and disinfect the premises recently vacated by the patient, or otherwise protect new tenants against the danger of infection. The health inspectors, from their knowledge and experience in factory conditions, are in a position to accomplish still more good by being required to keep a record of the dwelling place, occupation and physical condition of all persons in their respective districts who have been inmates of the State sanatoria, and from time to time forward to each State sanatorium a report of the condition of the persons who have been treated therein. By thus following the occupation of such persons greater protection would be given to the other employees, especially to minors, who owing to the nature of their work, frequently mingle with adults in various parts of a factory.

To local health authorities physicians report infectious diseases of all kinds. Naturally, then, it is the business of local health authorities to take some steps toward the discovery of tuberculous persons in factories and

workshops. The information which the board must have in such cases comes chiefly from two sources, (*a*) the practicing or (*b*) the physician to the board. Such information gained is then put into the possession of the State Inspector of Health for investigation.

A study of the hygiene of factories and workshops where clothing is manufactured likewise involves more or less constant dealings with the local health authorities.

One important function of the State medical inspectors (State Inspectors of Health) is to co-operate intelligently with the State Board of Health in forwarding the work of the water supply and sewerage department regarding questions of water supply, sewerage, stream pollution and allied subjects. A specific duty of the inspectors, for example, is to see that pure drinking water is provided in factories. The inspector inquires first as to the source from which the water is taken. If the water is from a public water works he can obtain information as to quality by consulting the engineer of the State Board of Health; if from other sources he ascertains first what information the engineer can give him. If he finds that an examination of the source of supply is deemed necessary or desirable, the Board will cause it to be examined. Whenever manufacturing or other corporations intend to supply water to the public there are ways in which the inspectors can be of considerable assistance. One way, for example, is by calling the attention of local authorities to the laws relating to questions of water supply, and to the fact that assistance is obtainable from the State Board of Health in such matters. For instance, when a manufacturing corporation is considering the subject of the introduction of a new or an additional water supply, it is important that they shall be informed of the necessity of submitting outlines of their plans to the State Board of Health, and of the desirability of obtaining such information as they can from the office of the Board before taking up the work. The inspectors have been instructed as to the manner of collecting samples of water for chemical analysis, so that if an inspector, while investigating factory conditions, observes or in some way discovers possible causes of pollution of a portion or all of the water supply of a factory intended for drinking purposes, he is in position to record certain facts, and either himself collect samples of water for analysis or notify the State Board of Health of the necessity therefor. Other reasons for entering factories in order to obtain information concerning water supplied for drinking purposes are (1) that the inspectors may see that reasonable precautions are taken to prevent employees drinking water which is unfit to drink, and (2) that they should so familiarize themselves with the manner in which all kinds of water is brought into the factory that in case of an outbreak of communicable disease they may be able to detect that the cause is due, e.g., to a temporary pollution of the supply used for drinking purposes. Large out-

breaks of disease have been traced, beyond question, by men familiar with factory conditions, to temporary pollutions of the drinking water supply. Under the present system the same inspectors who are familiar with the location of all the public water supplies of their district, and the areas from which these supplies are derived, are, owing to their duties in the factories, equally familiar with the factory supplies. Such an arrangement makes it possible to report promptly to the State Board of Health any suspicion of water-borne disease affecting the quality of the water supplied to factory employees.

In dealing with questions of sewerage, drainage and sewage disposal, the inspectors assist the work of the State Board of Health in much the same manner as in the case of water supplies. While inspecting factories they very commonly note improper if not dangerous conditions as to sewerage, drainage and sewage disposal. In every such case they not only may issue an order in accordance with the statute, which provides for proper water-closets for both sexes, — a provision which had always been enforced by some "factory inspector," — but they may go farther, and, owing to their close co-operation with local health authorities are not infrequently successful in their attempt, call to the attention of the board of health of the city or town wherein the factory is located the necessity for the board's using their power to cause the factory in question to be connected with the public sewer, or to take such other action as is deemed necessary for the protection of the public health. In this connection the law relating to the sanitary provisions in foundries is especially applicable. This law can only be enforced by a medical inspector (State Inspector of Health) as a "factory inspector," whenever it is practicable, by reason of the presence of public or private sewerage or of any running water system; but with the advice of the State Board of Health in matters pertaining to water and sewerage systems, and by virtue of his authority as State Inspector of Health, owing to his frequent dealings with local health authorities, such changes as will entirely remedy the defects in the foundry conditions referred to may be brought about by means of other statute provisions. In other words, it will be seen that the proper enforcement of the statute provisions relating to water-closet and toilet conditions in foundries can oftentimes only be made after a careful examination of the foundry conditions and consultation with the State and local boards of health, — again showing the close co-operation between factory inspection work and work done by State and local health authorities.

In brief, the medical inspection of factories involves constant practical co-operation with the State and local boards of health in so far as the following subjects are dealt with: —

(1) Prevention of the spread of tuberculosis and other infectious diseases among minors and adults in factories.

(2) Discovery of the ill health or physical unfitness of minors in factories. Notification of the minor's parents of condition of ill health found, with recommendation to consult the family physician.

(3) Exclusion of minors from unhygienic occupational influences or irritating poisonous dusts or gases, from contact with which the health of the minors may suffer.

(4) Study of the effect upon health of occupation on persons dismissed from State hospitals for consumptives. Protection of the health of adult and minor employees associated with such persons.

(5) Tracing communicable diseases to factories during an epidemic.

(6) Regulation of artificial moisture and temperature in textile factories.

(7) Provision for adequate supply of pure drinking water for factory employees.

(8) Provision for proper disposal of sewage from factories and foundries.

While it is true that all kinds of factory inspection, including the enforcement of laws relating to the proper safeguarding of machinery and laws relating to the employment of illiterate minors, by medical men exclusively would be neither practicable nor economical, it is equally true that medical men alone are in a position to make the best use of facts obtained concerning the sanitary conditions of the premises where men and women work; to study the possible injurious effects of certain processes upon health of the persons engaged therein; to inspect devices designed to protect employees against injurious and dangerous substances; to inquire as to the health of the employees, both for the purpose of aiding those found in ill health or physically unfit for work, and for protecting others from infectious diseases; to make physical examinations of minors engaged in trades or occupations deemed to be injurious to health; and to collect, and make proper use of, all facts and data pertaining to occupational hygiene.

On the other hand, aside from work requiring special technical knowledge, the sanitary (lay) inspector is of considerable less worth to the comunity than the medical inspector, who may accomplish all that the layman does, and, in addition, by virtue of his medical training, may give better protection to the operatives (1) by knowing (*a*) the conditions to look for which give rise to occupational diseases (for example, lead and mercurial poisoning), occupational intoxication (for example, naphtha), eye fatigue and eye strain; (*b*) the symptoms or signs of such disorders; (*c*) the excessive use of certain groups of muscles and certain organs of the body; (*d*) the defects in these organs caused thereby; (*e*) the occupations or processes in which a constrained attitude is maintained while at work; (*f*) the effects of such postures upon health; (*g*) the injurious

effects upon health of extremes of heat and temperature in connection with the enforcement of the statutes regulating the humidity and temperature in textile factories; (2) by being able to decide, partly from their knowledge of histological and pathological conditions, as to whether dust is fine enough to be inhaled, as to its effects upon the respiratory and other organs, and what types are most dangerous; and (3) by correlating cause and effect, and being able to make due allowance for bad inheritance, excesses and unhygienic home conditions, and other factors, when operatives are found in poor physical condition in certain occupations, and thus assist in arriving at conclusions as to what occupations are injurious to health.

PROPRIETARY PREPARATIONS ADVERTISED AS UNSALABLE AT RETAIL DURING 1910.

During the year 6 proprietary preparations containing alcohol, and with no statement as to the amount, were advertised as unsalable at retail, under the provisions of chapter 386 of the Acts of 1906, namely: —

Dr. Carpenter's Equalizing Drops. Prepared and supplied only by Drs. Carpenter (Drs. Geo. C. and Mary A. Carpenter), Lowell, Mass.

Improved Sun Cholerine Mixture. Prepared only by the Walker-Rintels Drug Company, 52 Temple Place, 166 Summer Street, opposite Station, and 244 Boylston, corner Church Street, Boston.

Vino de Quina y Cacao del Dr. Castillo. Gutierrez Hermanos, Jerez.

Highland Malt Extract. The Springfield Breweries Company, Springfield, Mass., U. S. A.

Coke Dandruff Cure and Hair Tonic.[1] A. R. Bremer Company, New York, Chicago.

Mysterious Pain Cure. Junius Barnes & Son, Proprietors, Burlington, Vt. (Also contained laudanum.)

The following preparations were also advertised as unsalable at retail under the provisions of chapter 386 of the Acts of 1906: —

Gauvin's Aniseed Syrup (Sirop D'Anis Gauvin).[1] J. A. E. Gauvin, Dispensing Chemist, 850 St. Catherine Street, East Montreal; Branch, Lowell, Mass. (Contained morphine, with no statement as to the percentage of morphine present.)

Kefaline: The Celebrated Headache Cure. Manufactured by the Kefaline Company, Boston, Mass. (Contained acetanilid, with no statement as to the percentage of acetanilid present.)

[1] Prohibition later revoked.

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